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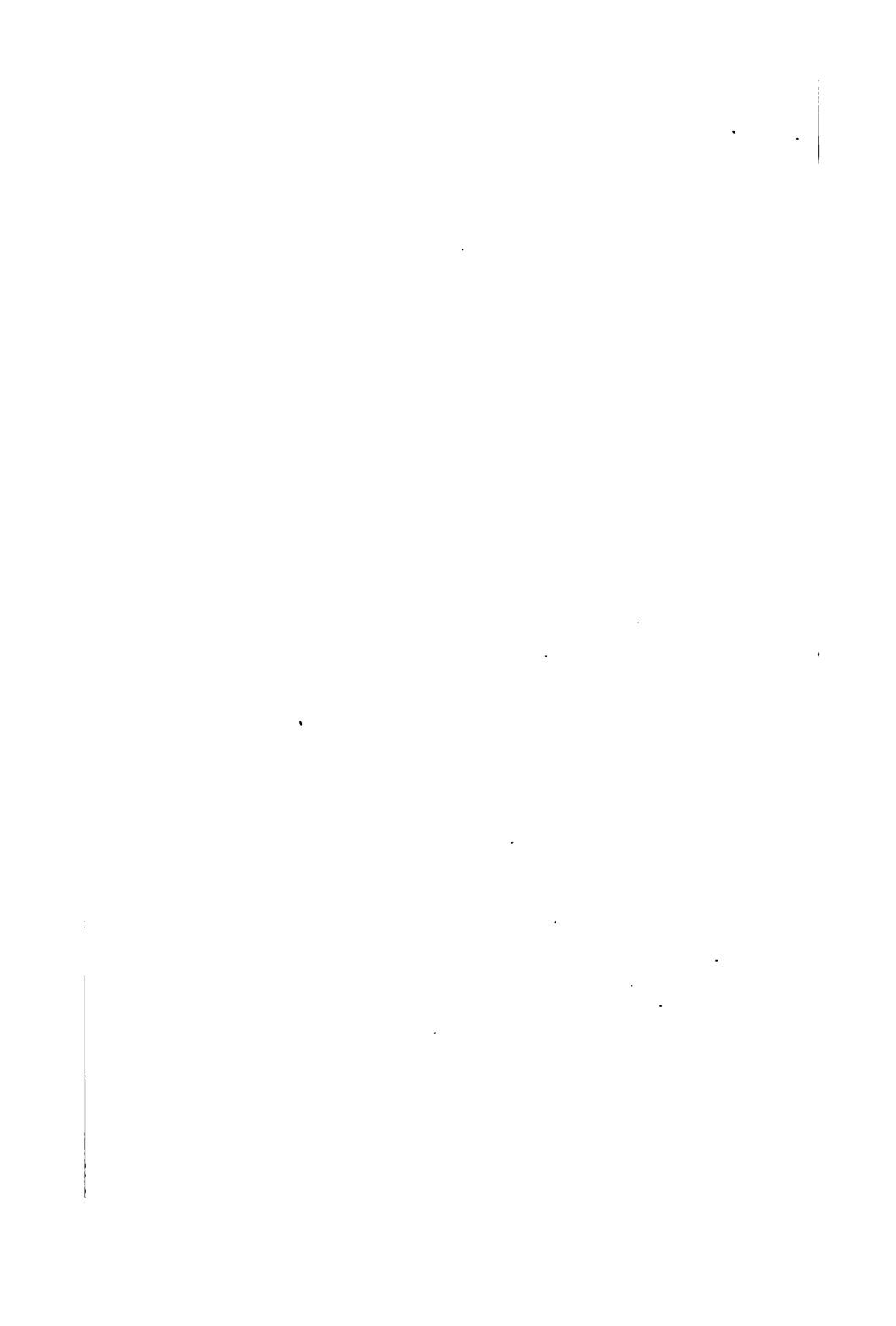
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THE
NOAIC
DELUGE.



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THE NOAIC DELUGE:

Its Probable Physical Effects and
Present Evidences.

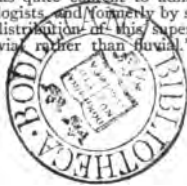
BY THE REV.

S. LUCAS, F.G.S.,

AUTHOR OF "SERMONS ON THE MYSTERY OF GODLINESS," ETC., "CREATION
REDEMPTIVE," AND "THE BIBLICAL ANTIQUITY OF MAN."

"That calleth for the waters of the sea, and poureth them ou
upon the face of the earth."—*Amos* v. 8.

"In conclusion, he was quite content to adhere to the opinion
held by the French geologists, and formerly by several of our most
able writers, that the distribution of this superficial drift was in
the first instance diluvial rather than fluvial."—*J. W. Flower,*
Esq., F.G.S.



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PREFACE.

THE title of this work sufficiently explains its character and purpose; and, hence, any lengthened preface to it is unnecessary. It is largely unique. As was naturally to be expected, from its historical position and moral significance, the Noaic Deluge has engaged much attention, and has often been made to supply impressive moral lessons; but, unless that of the late Dr. Buckland, in his "*Reliquiæ Diluvianæ*," be regarded as such, we know not of any previous attempt, either to describe the physical effects which it would produce, or to trace and identify its present evidences. This is the task that is undertaken in the present work: with what success the task is executed must be left for others to determine.

Part of the same general ground here surveyed was also embraced in the author's previous work, on the "*Biblical Antiquity of Man*;" but he believes the reader will find little, if any, repetition,—the present work being composed entirely independently of the previous one, and, except its motto from Humboldt,

without one quotation from it. Then, in the previous work, the views which are at all similar to the views contained in the present one, were, more or less, necessarily scattered throughout its pages, standing related to the different positions sought to be proved, and finding their proper place respectively in Man's Biblical, Archæological, and Geological history. On the contrary, in the present work only *one* general purpose has been kept in view ; and it has been sought to present to the reader at once the whole phenomenon of the deluge.

Then, most of the examples now brought forward, and especially those that are dwelt upon at any length, are distinct from those given in the "Biblical Antiquity of Man." The treatment of the subject is also, as a matter of course, more simple, being confined to the consideration of the one great theme which the title announces. The reader will here find the momentous subject of the biblical deluge, the findings of geology bearing upon it, and the theories which the adherents of geology have formed respecting the great antiquity of man, brought into one connected and comprehensive view. All these topics, the writer trusts, have been candidly dealt with. He, at least, feels conscious that no difficulties besetting his own

solution have been *designedly* overlooked or evaded ; and that no *facts* requisite to a just and impartial view of the subject have been omitted or distorted. Nothing, in short, has been *assumed* but the truth of Scripture statement,—this, as the author is fully persuaded, being abundantly warranted by the clear and manifold evidence, amid and on which its truth sits enthroned, and from which he feels assured that no attacks from the savants of science, or from unfaithful sons of the Church, can cast it down. Before the shrine of truth's great Author, the writer desires to present this attempt to assert and to vindicate its claims ; satisfied if he have only succeeded in arming any against the insidious scepticism of the day, in reclaiming any of its victims from its baneful power, and in restoring them to the calm and safety which flow only from an intelligent faith in the oracles of Eternal Love.

But, before closing this preface, it is perhaps necessary, that for the sake of precision and for the assistance of the general reader, we should define the few technical terms employed in this work. As far as was consistent with brevity, these have been studiously avoided, still some few have been used ; and it is important to state the sense in which we have em-

ployed them. The term *Pliocene*, of Sir C. Lyell, is used in the sense in which he himself first employed it—to express the period of time which preceded the Glacial epoch, and which closed at the commencement of that epoch. With this period, the *Pre-glacial* one of course synchronises. The “*Glacial epoch*,” is that period of intense cold which extended from the close of the Pliocene, to the beginning of the Pleistocene period,—when large portions of the globe were covered with glaciers and enormous sheets of ice, and other portions were submerged beneath seas filled with icebergs. This, at least, is the sense in which the phrase is employed in this work. The *Post-glacial*, the *Pleistocene*, and the *Quaternary*, when used in their general sense, are but different names for the same epoch—embracing the whole period which has elapsed since man’s first appearance on the earth, up to the historic age. When, however, we use the word *Pleistocene*, as distinct from the word *Prehistoric*, by the *former* we mean the antediluvian period,—or the period which intervened between man’s introduction on the earth and the Noaic flood; and by the latter, the time that elapsed between that flood, and that point in the past to which history carries us back.

It is difficult, of course, to draw any fixed and fast line between these different epochs of past time. Nor is it necessary. It is enough that we can separate them generally as epochs. Pliocene, Glacial, Pleistocene, and Prehistoric, are terms expressing real and distinct portions of past time, and portions presenting their own distinct characteristics. They can thus be defined with sufficient precision for every practical purpose; and with a precision sufficient for testing any theory that may be based upon their difference of age.

INTRODUCTION.

The unique character and admonitory purpose of the deluge.—
Miraculous in its origin, though employing natural elements.—
No natural force could produce it.—The deluge may be ignored,
—but cannot be blotted out from Scripture, nor its evidence
from geological deposit.—It must have left its effects behind,
sooner or later to be discovered.

IN “Noah’s flood” we have an historical account, not only unique in itself, but ~~also one that is both~~ majestic in its character and admonitory in its purpose. An immediate interposition of the Divinity for the punishment of aggravated human transgression, is the truly solemn fact which it presents for our contemplation and for our instruction in righteousness. On the page of the world’s history, and among the records of national tradition, it stands as an impressive beacon of warning against the commission of evil,—a beacon which is as appalling as it is magnificent. Regarded only as a mere physical event, and apart from its great moral purpose, it is scarcely possible to form an adequate conception of its terrible grandeur. But thus to regard it, would be to do it a great injustice. True, its immediate and palpable forces were material elements; but these elements were wielded by a Divine hand, and acted at the command of the great

Creator. We run no risk of contradiction when we affirm, that nothing at the command of mere natural law, or of mere material force, could produce it. Its own singular and stupendous character, and, at least, general extent, place it beyond the reach of all ordinary events, and forcibly bespeak its Divine origin. It is not the gentle whisper of quiet, nor the louder utterance of agitated, nature, but the thunder voice of almighty God which speaks in it. No mere natural forces, however gigantic and powerful, could "break up all the fountains of the great deep, and open the windows of heaven;" consequently, these events must be deemed miraculous, and be referred to the irresistible energy of the omnipotent Being who rules on high.

In speculating on the later geological changes that have occurred in the globe, writers on the subject may ignore any such miraculous interposition as the biblical deluge implies; but they cannot blot out the record respecting it standing on the page of eternal truth, nor efface the evidence in its favour, that has so long been treasured up in the superficial deposits that are found scattered over the face of the earth. That such evidence exists, is an assumption which is as just in itself, as it is clearly warranted. That an event so stupendous as the biblical deluge is stated to have been, could transpire, and yet leave no permanent effects behind, it would be a palpable absurdity to imagine, and most irrational to assert. Such effects

may have been largely modified, and even obscured, by subsequent change, wrought by elemental and other action; but that all evidence of them has been obliterated and destroyed, it is impossible to believe. Like the characters on some very ancient document that has suffered much from the inevitable accidents of time, the record may be difficult to decipher, and especially to separate from earlier and later records that may have become mingled with it; but it is undoubtedly treasured up somewhere, one day to reward the researches of the devout explorer, to confirm the faith of sincere believers in Divine truth, and to repel and rebuke the presumption of the daring sceptic. The deluge admitted, and especially admitted in the magnitude and duration given to it in the Bible history, it is most legitimate to believe that it has left corresponding marks of itself upon the deposits of loam, sand, and gravel, which were either thrown down by its own action, or which came within the reach of its modifying influence.

CHAPTER I.

THE PROBABLE PHYSICAL EFFECTS OF THE DELUGE.

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THE PROBABLE PHYSICAL EFFECTS OF THE DELUGE.

The scriptural account of the deluge quoted—The facts to be considered.—The breaking up of the fountains of the great deep.—The forty days and forty nights of rain.—The one hundred and fifty days of quiet, and the retiring of the diluvial waters.

WHAT the probable effects of the deluge would be we must now proceed to inquire. To ascertain, with as much accuracy as possible, what consequences would result from such a flood of waters on the earth, is an indispensable step in the investigation that we have undertaken. That the deluge would produce stupendous and often very complicated effects, is absolutely certain. At the same time it would considerably modify, and in many instances largely destroy, the effects of much preceding elemental action, and even mingle such effects with its own. In other words, acting, as it largely would, on all preceding superficial deposits, it would at its close naturally leave a very complicated phenomena for investigation. The leaves of previous records would be removed from their natural place in the series, and the last in time would become first in place. In fact, it requires no small effort of thought to conceive how profoundly the deluge would complicate the deposits forming the surface of the earth. The language

which Scripture employs to describe it must impressively convince us of this fact.

This language clearly implies its Divine origin. Whatever were the instrumentalities employed, they were wielded by Jehovah's own hand. According to express Scripture statement, it was the arm of Omnipotence that "broke up all the fountains of the great deep, and opened the windows of heaven." In their terrible work of destruction, the natural elements were impelled by supernatural agency, and were guided to the accomplishment of their fearful judicial purpose by an infinite Wisdom. All this is as positively asserted as it is significantly implied. The action expressed is too obviously contrary to any of the known laws of nature, and was too immense and prolonged in its operation, to be reasonably attributed to any natural cause. Hence, we take our stand on its supernatural character. In attempting to trace its effects, we shall recollect that we are tracing the doings of the Almighty, who has thus arisen to punish all the wicked of the earth, and to sweep them from off the scene which they have filled with pollution and violence.

The principal Scripture passage relating to the deluge has already been quoted; but it may the better prepare us to conceive of the probable effects of that deluge, and to describe them, if, before proceeding any further, we give the Scripture account somewhat more in full. "In the six-hundredth year

of Noah's life, were all the fountains of the great deep broken up, and the windows of heaven were opened. And the rain was upon the earth forty days and forty nights. And the waters increased, and bore up the ark. And the waters prevailed exceedingly upon the earth, and all the high hills that were under the whole heaven were covered. And every living substance was destroyed which was upon the face of the ground, both men, and cattle, and the creeping things, and the fowl of the heaven; and they were destroyed from the earth; and Noah only remained alive, and they that were with him in the ark. And the water prevailed upon the earth an hundred and fifty days."

Now the facts which we have here to consider are, the breaking up of the fountains of the great deep; the forty days and forty nights of incessant rain; the prevalence of the diluvian waters at the same height for one hundred and fifty days; and the subsequent retiring of the waters from the face of the earth.

To get at the probable effects of the deluge, we have to estimate the action, both separate and combined, of these several forces, and also their separate and conjoint results. From this statement it will at once be seen that the problem before us is a very difficult and complicated one; and hence, that nothing but the most daring presumption can venture to assert beforehand, that the deluge was not equal to produce the phenomena which we provisionally ascribe to it.

SECTION I.

THE BREAKING UP OF THE FOUNTAINS OF THE GREAT DEEP.

Difficulty in ascertaining the precise meaning of the phrase.—But whether internal reservoirs or open oceans be meant, powerful water-action is expressed.—The effects produced would be immense, and greatly exceed those of flood or storm.—Supposed by some to mean internal reservoirs.—Might form lake basins.—The open oceans of the globe may be meant.—The tumult of the meeting waters.—The complicated phenomena left.

WE acknowledge that it is difficult, if not impossible, to ascertain the precise meaning of the expression: "And all the fountains of the great deep were broken up." But whatever may be the precise facts which it was intended to designate, it indisputably expresses a very general movement of immense bodies of water. Whether these fountains, as some have supposed, were internal reservoirs, covered with a crust of earth and rock, or, as others think, the various open seas of the globe, in either case the action must have been truly immense, and the consequent results stupendous. When all these fountains of the great deep were broken up, the rush of water, the tearing up of materials, and the change and destruction wrought, would necessarily be vast and extended. It is, in fact, impossible to calculate the sweeping,

destructive, and modifying power of such immense bodies of water, forcibly driven over the surface of the earth. The swell and rage and frightful havoc of one of our most terrible storms, or 'gigantic marine earthquakes, are as mere child's play, when compared with what would be produced by the breaking up of all the fountains of the great deep, and the rush of their waters upon the doomed globe. To form anything like an adequate conception of the effects which would be wrought, we must multiply a million-fold the change and destruction which overtake the scenes, villages, and towns, of some beautiful valley by the bursting of an upland lake or reservoir.

If "the fountains of the great deep" mean internal bodies of water, covered by an external crust, then the breaking up of these fountains would produce immense rents and fissures in that crust; and would also result in large areas of depression, formed by the sinking down of the superincumbent mass that had rested upon and arched over these internal reservoirs. Profound lake and river basins might thus be formed, where none previously existed. Then if this meaning were admitted, it would enable us to assign a reason for the comparative absence of marine remains in the deposits which we regard as diluvial. It would also render more probable an idea broached in the work on the Biblical Antiquity of Man, respecting the greater extent of dry land which obtained during the antediluvian period, and the probable connection of

countries,—such as England and France, Spain and Africa,—now separated by narrow seas or channels. We throw out these hints, not because our solution needs them, but because they may cast some light on geological questions that are yet unsettled. The mode in which our lake basins were formed is still a disputed point among geologists. Perhaps the above suggestion is as probable as most of the solutions that have been attempted.

Again, should “the fountains of the great deep,” mean the open oceans of the globe, then the breaking up of these must have produced effects equally stupendous. Impelled from their natural resting places by the command of Him “that calleth for the waters of the sea, and poureth them out upon the face of the earth,” they would rush up every valley and gorge, mingle in powerful conflict, as sea met and blended with sea; would seem to wage fearful battle with every obstruction in their course; masses of materials from the earth’s surface would be torn up, and be tossed and whirled with ceaseless fury; whatever lay in their path would be subjected to immense crush and pressure; and as a final result, a complicated wreck would be left, which it is impossible to depict, and impossible even to conjecture.

SECTION II.

THE FORTY DAYS AND FORTY NIGHTS OF TORRENTIAL RAIN.

The effects feebly illustrated by thunder-floods.—The great denudation of all superficial deposit.—Would create conflicting currents.—Would fill river-beds.—The two waters would mingle, and complicate the results of each other's action.—As they rose, would flow in new directions.—The representation truly scenic.—Destruction of man and land animals complete.

THEN we must experience the same difficulty in realising the effects which would be produced by forty days and forty nights of what was evidently torrential rain. If, as we have often seen, a few hours of thunder-storm can deluge our streets and fields, plough out deep and yawning "furrows" in our roads and in the sides of hills, swell small streams into rushing torrents, flood mighty rivers with mud-charged waters, sweep away tons of rock, gravel, and sand, and present at their close a most strangely commingled debris; then what would necessarily be the result of forty days and forty nights of *such rain* as is implied in the account which the Scriptures give of Noah's flood? For a considerable time, and until the earth was largely covered with the prevailing waters, the destruction of all surface deposits would be enormous. Except on plains, or on the more level portions of the earth's

surface, or where they were sheltered behind barriers, we should expect all superficial materials, and especially those in open valleys, and on the sides and slopes of hills, to be largely, if not bodily, swept away. Poured out upon the vast extent of surface implied, such fierce and prolonged torrents of rain would create a thousand rushing and conflicting floods, carrying waste and destruction wherever they came; sweeping the materials in their way, and borne along by their fury into depressions, or into old beds of rivers or lakes, obliterating or filling them up, creating for themselves temporary, and it may be permanent, channels, to reappear in the new world after the flood.

Nor must we overlook the combined action and the combined result of the twofold force which we have now before us. We must remember that "the fountains," the immense bodies of water rushing up from the great deep, and those supplied by the teeming and ceaseless torrents poured from the opened windows of heaven, would mingle in awful play, would blend their furious waves, would meet in conflict like contending seas, rising up, as they embraced each other, into mountains of foam; would augment while they largely complicated each other's action; and as a sure consequence produce results which are as perplexing as they are immense!

Nor is this all. We must further remember, that as these two bodies of commingling waters rise, and prevail on the earth, they will come into new combina-

tions, rush into conflict from new points of the compass; begin their course of destruction from new centres of departure; and will largely change and modify their own previous work. The language of the narrative tells us, that *then*, as now, there were high hills on the earth under the heaven; and of course there were valleys and plains associated with them. Probably, indeed, the surface of the globe presented then the same general features that it presents now. At all events, there were "high hills," towering Ararats, Alps, and Himalayas, and, as a matter of course, as the ever rising waters gained height after height, and capped mountain after mountain, the swelling currents would rush forth in new and diverse directions, ever increasing, and ever more and more complicating the final results. We feel, in fact, that to describe, and to assign to each force its respective part in this awful play, to decipher the characters, which each singly, and both combined, have left, and to solve the problem which they created for the investigation of post-diluvian man, would require the tongue of an archangel and the eye of Omniscience.

The description that is given of the deluge by the inspired narrative is as graphic as it is solemn. Its representations are truly scenic, and most vividly place before us the terrible progress and the fearfully triumphant accomplishment of the judicial purpose which the deluge was sent to effect. The description opens with a solemn grandeur of phrase. "All the

fountains of the great deep were broken up, and the windows of heaven were opened. And the rain was upon the earth forty days and forty nights. And the waters prevailed exceedingly upon the earth; and all the high hills that were under the whole heaven were covered. And every living substance was destroyed which was upon the face of the ground, both man, and cattle, and creeping things, and the fowl of the heaven; and they were destroyed from the face of the earth; and Noah only remained alive, and they that were with him in the ark." In the whole area embraced by the flood, the destruction of man and of land animals was entire and complete. The deluge had done its assigned judicial work.

But what was the extent of the deluge? Where are the materials which it drifted before it, or took up in suspension? And where are the remains of man, and of the animals who perished by it? These, it must be confessed, are grave questions, and difficult to answer; but they must be faced and answered to the best of human ability, before we can rightly estimate the effects of the deluge; and especially before we can be prepared intelligently to weigh and state the force of its present evidences. Perhaps, for the present, and until we have considered the action of the two remaining forces operating in this case, these questions had better remain in abeyance.

SECTION III.

THE QUIESCENT STAGE OF THE WATERS OF THE DELUGE.

The waters of the deluge remained at the general height attained at the end of the forty days, etc., for one hundred and fifty days.—Dr. Lightfoot quoted on the point.—The large amount of diluvium deposited by the quiet mud-charged waters of the deluge, general.—Its depth would depend on circumstances.—At first would be general.—Its great depth in valleys.—Its great depth and extent difficult to account for.—The state left by the two preceding forces of the deluge.—Rivers obliterated.—No local flood could imitate its effects.—Would probably drift marine shells.

DURING the forty days and forty nights of rain, the two bodies of water whose action has already been considered, have risen fifteen cubits, some twenty-three feet, above the highest mountains; and, according to the sacred narrative, remained at this height for a period of one hundred and fifty days. The great Hebrew scholar, Dr. Lightfoot, tells us that these two periods, of forty days, and of one hundred and fifty days, are to be reckoned as distinct, and not the forty days as included in the one hundred and fifty days; so that when the one hundred and fifty days were ended, there were six months and ten days of the flood past.

If this view, as it doubtless is, be correct, then after the incessant rising of the waters of the flood for forty days and forty nights, there followed a lengthened period of quiescence. The fearful turmoil had ceased, and having finished its terrible work of destruction

and death, the once swelling flood quietly rested over the grave of a perished world.

A new process now begins, or a process begun before is carried on with greater energy. Hitherto the work has mainly been one of destruction. Surface denudation has necessarily been immense. And yet, almost from the first, deposition would also take place. In a comparatively short time, the larger and heavier materials removed by the rushing and rising waters of the deluge would be dropped, stranded on some shallow, arrested by some barrier, or drifted into some depression. Then, as is well known to be the case, the meeting currents would largely force each other to part with the materials which each current was drifting along with it, and which would thus be strangely associated, and pressed, and crushed together; and would be lodged in positions where no other force would or could lodge them. Then, next to these heavier and coarser materials, would come deposits of gravel, for the most part, the coarser first, then the finer gravel, then sand, and lastly, and mostly, over the whole, "inundation mud."

With these several materials the waters of the flood would be charged. The gravel and the larger particles of sand would probably soon be parted with. But the immense amount of lighter earthy particles taken up in suspension would require for its deposition the whole period of quiet implied in the one hundred and fifty days during which the waters of the flood

remained in a stationary position. In sheltered places, such as caves, and fissures, and wherever the rising waters were less turbulent, mud deposits would occur from the first; but it would not be until the waters had gained their general level and quiet, that their muddy contents would be generally parted with, and spread over the face of the earth.

The depth of the deposit thus thrown down, would, of course, largely depend upon circumstances. At the first it would doubtless be general. A portion of it would be lodged on the most elevated points. But in valleys, and in deep depressions, its thickness at the first must have been immense. Fifty, or even one hundred, or more, feet of depth would not be too much to expect to find in such situations. Then it would necessarily be deposited more generally, and over more extensive areas than would the coarser materials, whether composed of boulders, gravel, or sand, drifted by the deluge. And as their deposition would precede its own, it would everywhere be found both resting upon and overlapping them. And if such conditions do not now exist, or are greatly modified, it is, as we shall afterward see, because, when returning to their lake and ocean beds, the waters of the flood largely swept away and also largely modified, the loose and lighter deposits which they had previously thrown down on the surface of the globe. The gross amount of this fine material would be truly incalculable; and upon any theory which ignores the

Noaic deluge, its great depth and extensiveness would be most difficult to account for. And as a matter of fact, and as we shall see when we proceed to consider the present evidences of the deluge, its immense depth and its wide extent have sadly perplexed and exercised the ingenuity of many of our geologists; and to account for it, and to explain the source and mode of its deposition, they have been obliged to have recourse to theories which are neither very probable, nor very consistent.

Before noticing the last force operating in the deluge, we may be permitted to pause, and to try to review the stage of this grand event at which we have now arrived. The waters from "the fountains of the great deep," together with those supplied by the prolonged torrents of rain, have wrought, and for the present, have finished, their work. In valleys and depressions, on low plains, and frequently on the sides of hills, masses of rock, and immense quantities of gravel and of sand, have been thrown down. Probably some of the lesser valleys and some river-beds have been largely obliterated by the deposit of diluvial debris. Rents, fissures, and caves, have been partially or wholly filled up by it. The materials which such caves and fissures previously contained have been buried beneath those carried in by the waters of the deluge, and in many cases have doubtless been largely mixed and blended with them. Then, as is very probable, if men and animals had previously inhabited

these caves, or had fled to them for refuge from the fearful torrents of rain, and from the rage of the devouring waters, their remains may have become associated with the previous contents of the caves, either lying upon them in successive layers, or strangely mingled with them in one broken heterogeneous mass. Again, over all would be a bed of diluvium ; a mass, more or less thick, of fine deposit, formed from the mud-charged waters of the deluge, as they gradually parted with the earthy matter they had so largely taken up in suspension. These, like the waters of the flood, would cover the whole earth, and would largely correspond with its irregularities of surface. And they would thus be found occupying positions where no local floods, and where no mere river-action could possibly deposit them. Then their mode and form would be equally peculiar. Gradually thrown down from an immense body of water, everywhere charged with them, and mainly quiescent, they would, in proportion to the depth of the water over it, fall equally on the whole surface,—wrapping, like the folds of a close-fitting garment, around every irregularity of that surface, in a way which it would be impossible for the waters of any local flood to imitate.

Such would be the probable state of things at the close of the one hundred and fifty days, during which the waters of the flood remained stationary at a height of some twenty-three feet above the highest mountains.

At present, we need not dwell on the possibility of marine remains being found at considerable distances from the present seas, and of such remains being more or less mixed with land and freshwater shells. It is enough to mention this, as should such remains be found in our superficial deposits, we shall have assigned a cause sufficient to account for them. The waters of the ocean, as they were violently poured out upon the earth, would be most likely to drift shells and other marine products along with them, to be thrown down, along with the other debris of the deluge, not only near the sea, but also at considerable distances from it.

SECTION IV.

THE RECESSION OF THE WATERS OF THE DELUGE.

The length of time occupied by this action, and the effects of this action.—Evaporation of a portion of the waters.—Its portion of vapour returned to the atmosphere.—The return not sudden.—Would leave a succession of complicated results.—Would act on a succession of levels.—Would cut down into and redeposit the remains of older formations.—Would leave deposits on different heights.—Deposits of the deluge itself largely swept away by its retiring waters.—Remarkable forms of denudation.

THIS is the last force which the deluge presents. What, then, would be its probable effects? What results would the retiring waters, as they returned from the earth, naturally produce on its surface? This action appears to have occupied a period of from five to six months before its results were complete. "On the seventeenth day of the seventh month, the ark rested on the mountains of Ararat. And the waters decreased continually until the tenth month; in the tenth month, on the first day of the month, were the tops of the mountains seen." The cause of this decrease was twofold: evaporation and drainage. "God made a strong wind to pass over the earth, and the waters were assuaged;" "and the waters returned from off the earth continually." The passing of a strong wind over the earth would cause a rapid evaporation of the waters of the deluge, and would



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embrace one class of phenomena. The comparatively gradual action stated, while producing, on the whole, effects equally stupendous, would necessarily produce effects much more difficult to decipher and explain. A body of water that had covered the earth to a height which embraced its loftiest mountains, continually retiring for the space of five months would produce much more extensive denudation, and would cut out for itself deeper and wider channels, and would create a much more complicated phenomena, than would the same body of water suddenly rushing from off the earth. Such a sudden rush of waters would, we admit, necessarily sweep away an almost inconceivable amount of surface materials; but then, wherever deposited, such materials would exhibit little or no arrangement, but for the most part would be homogeneous,—presenting no succession of beds, the different materials being mixed together throughout the deposit. But the effects produced by the same volume of water retiring from the earth in the space of several months, would not only be more immense in their degree, but also unspeakably more complicated in their aggregate character. In this case there would be successive and ever varying denudation, and also successive and ever varying deposition. As the waters retired and abated, the denuding force would act on a succession of lower levels; while the irregularities existing on the surface of the globe, and the manifold directions in the strike of valleys, would cause

that denudation frequently to vary in its course and form. One after another lower lying deposits would suffer, and be largely swept away. Whether they existed before the flood, or were thrown down by the first rush of its waters, or were deposited by its recession when its waters stood at a higher level,—in each case they would be subjected to immense waste.

It is also very probable that in many cases the retiring volume of water would cut down into older formations, such as the boulder clay, the different Tertiary strata, and into whatever formation constituted the surface, sweeping away the materials obtained from them, and redepositing them over other beds,—not only of Post-tertiary age, but also over those composed of the debris supplied by the deluge itself.

Then the operation of the above manifold cause would also lead us to expect deposits at different heights, on the sides of hills, and on the flanks of valleys, and especially of river valleys, suggesting to an observer who ignores the deluge the plausible conclusion that since the upper deposit was thrown down, mere sub-aërial action has deepened the valley to the extent of the difference of height between that upper deposit and the bottom of the valley! Thus, deposits of gravel and sand which were really of contemporaneous origin, and whose contents largely resemble each other, might be regarded as separated from each other by ages upon ages. In fact, the latest or more recent deposits might often be regarded

as the most ancient. Deposits, for example, containing the remains of man and of contemporary animals, being overlaid by materials swept out from the boulder clay, or from Pliocene strata, it would naturally be inferred that man's appearance on the earth dated from before the Pliocene and Preglacial epoch. To account, in short, for all the varied effects which the deluge, and its continually retiring waters, would produce, theories which are as extravagant as they are often inconsistent must be devised. Mighty forces must be summoned to play a most important part on scenes in which it is most difficult to conceive their existence; and must be supposed to have produced effects to which they are utterly unequal, and which they have never been known or seen to produce.

This remark is largely true with respect to most of the effects which would be produced by the deluge; but it is especially true of the immense amount of diluvium, of inundation mud, which its manifold action would supply, and which it would finally deposit over the face of the earth. At the close of the one hundred and fifty days of quiet (allowing for the respective depths of the water), this would be evenly spread over the whole surface of the globe—so far at least, as that globe had been covered with the waters of the flood. But this state of things the ever retiring waters would soon and largely begin to change. Where there were no barriers to protect it, the denudation of such fine mud would be immense. On wide level

plains, in depressions of the earth's surface, behind rocky barriers across valleys, and in other favoured situations, it would be largely preserved, and exist in great depth; but in open valleys it would be deeply or wholly cut through, the channels scooped out in it forming the beds of rivers; while on slopes and sides of hills it would be extensively swept away, or a patch of it be left here and there, to testify of its former widely extended existence.

It must, I think, be confessed that this is no fancied picture, but both a sober and just representation of the stupendous effects which the waters of the deluge would inevitably produce. While to account for these effects independently of such a deluge, and upon the supposition that no such miraculous flood of waters occurred, a combination of forces, which is both unlikely and complicated, must be assumed, or be summoned into existence.

SECTION V.

THE EXTENT OF THE DELUGE, AND WHERE ARE NOW THE REMAINS OF THE ORGANISED BEINGS WHICH IT DESTROYED ?

The extent of the deluge.—Coextensive with the distribution of the human race at the time of its occurrence.—The language of Scripture does not require us to believe in a universal deluge.—Its purpose a moral one, and only demanding the destruction of the human race.—The final determination of its extent brought about by scientific discovery.—The precise date of the deluge left undetermined.—The human race both numerous and widely spread at the time of the deluge.—We may expect a wide distribution of human remains. Where are the remains of the men and animals destroyed by the flood?—Caves and fissures in rocks.—River valley gravels.—Brick-earths.—Beds of rivers.—But lakes and oceans the principal repositories.—The considerations which make this probable.—Other sites would contain more of man's implements than of man's own remains.—The effects of the deluge not overstated.—Would produce all that has been attributed to it.

WE must now return to the twofold question, the consideration of which, and the answers to which, we deemed it best to defer to this stage of the inquiry. Was the deluge universal? And where are now the remains of the men and animals which its water destroyed? We feel that these are grave and, we will candidly say it, very difficult questions; and yet, as we observed before, they must be faced, and as far as

possible answered, ere we can deem our inquiry into the probable physical effects of the deluge complete.

The hypothetical ground which, with regard to the extent of the deluge, we have taken in another work, we are still disposed to maintain. As we are prepared unhesitatingly to maintain its miraculous character and origin, we at once assert, that if either clear Scripture statement, or thoroughly settled scientific fact, demanded it, no difficulties involved in a universal deluge would prevent us from firmly and, we fearlessly add, intelligently believing it. To urge physical or geographical difficulties against it, would not shake our faith in its occurrence. We know, and can conceive of, no *contradictions* in the case; and all considerations of mere difficulty, and even of unlikelihood, are literally as nothing when set against "the Power of God."

We do not think that the language of Scripture on the subject really teaches a universal deluge. After all the learned labour and criticism that have been bestowed on the words, "the earth," "all the highest mountains of the earth," and "under the whole heaven," we cannot feel convinced that they teach or demand an absolutely universal deluge. On the contrary, we believe that all these expressions can be legitimately explained, and their full force be given, without either asserting or supposing, that every part of the whole globe is included in them.

One important question to be asked in the case is,

Does the great *purpose* of the deluge suggest or demand its absolute universality? That great purpose, it is clearly and repeatedly stated, was a *moral one*; the signal punishment of human transgression. The great and general wickedness of antediluvian man was its direct provoking cause. Its infliction was designed to manifest the fearful magnitude of the evils of sin, and to show the unspeakable abhorrence in which the great Creator holds it, by visiting those guilty of it with a most terrible and exterminating judgment. Now the Scriptures do not teach, nor does our own reason and sense of right suggest, that this great moral purpose demanded animal destruction, or that it would be promoted by it. We may grant that the destruction of the animals existing in the areas occupied by man, might tend to deepen the impressions of the evil of man's sin, which his own punishment was designed to produce; but even this limited end could not be subserved by the destruction of the animals found existing outside and beyond those areas. Then I think we may reasonably conclude, that the destruction of animals within the areas embraced by the flood was rather *incidental* than otherwise; for directly and designedly the destruction did not include the creatures which could live in water; it only embraced land animals. Hence, we may logically infer that the deluge would not be rendered universal simply for the purpose of drowning animals alone. Its direct and special design was the destruction and

marked punishment of sinning man. Hence, if it embraced *all* that portion of the earth that had become occupied by man, and extended to the most distant horizon visible to the most widely dispersed individuals of the race, the great moral purpose for which the deluge was sent, would be fulfilled; and all that is really demanded by the language of Scripture would, we conceive, be realised. Under these circumstances, to the most distant spectator, to those standing on the last circle of human dispersion, the high hills under the whole heaven would be covered, and the whole globe would appear to be one wide and absolute waste of waters.

So far, therefore, as the language of Scripture and the great moral purpose of the deluge are concerned, we find no necessity and no reason for believing in an absolutely universal deluge. Hence, if this is demanded at all, it must be from other considerations, and on the ground of other facts, than any directly supplied by the deluge itself. We believe, in short, that the real extent of the deluge can only be certainly and satisfactorily determined by first determining the extent to which the human race had spread itself at the period when the deluge occurred. With the exception of the eight persons in the ark, we are assured that absolutely the whole human race was destroyed. We may, therefore positively conclude, that it extended wherever the human race had extended; but we see no reason whatever for believing that it extended to

any very great distance beyond the most extreme horizon of the last human inhabitant.

Thus, the *final* settlement of the question of the extent of the deluge must largely hinge upon the determination of a previous question:—How far, at the period when the deluge occurred, had the human race extended itself? Sacred Scripture itself wisely leaves this question open; not because afraid of contradictions or of disproof, but because its determination could answer no purpose of instruction or of warning. Hence, all that it *positively* teaches is (excepting, of course, the persons in the ark) the universal destruction of man. It encircled and overwhelmed the whole of his habitation. It swept him—the daring and polluted transgressor, “from the face of the earth.” “The flood came and took them all away.” And, so far at least as Scripture itself is concerned, this is the only fact that is absolutely settled. By the careful consideration of its suggestions and indications, we may gather much from Scripture respecting the extent of the human race at the time of the deluge; but it neither states nor gives any positive limit.

Hence, if the extent of the deluge can be determined, it must be by careful observation and by actual discovery. If, in the superficial deposits of the whole earth, and under the whole heaven—in the most unrestricted sense—human remains, possessing an antiquity of from *five* to *eight* thousand years, be found,

this fact would do more to settle the question respecting the extent of the deluge than will ever be done by all the conjectures and speculations of either philosophers or divines.

With regard to the *date* of the deluge, we advisedly use this elastic mode of expression; because, as we have elsewhere endeavoured to show, we believe that the Scriptures themselves, not only authorize, but demand a considerable lengthening of the period which has elapsed between the present date of the world and that of the occurrence of the deluge. Should indisputable scientific fact, carefully considered and cautiously interpreted, clearly show that the occurrence of the deluge must be dated much further back than the period assigned to it in our present systems of chronology, we should, without any hesitation, concede the demand. At the same time, such a lengthening of the duration of the *antediluvian* period, as we have also elsewhere shown to be probable, would allow for a much wider dispersion of the human race before the flood, than would be likely to take place in a period of only some twenty centuries. And should human remains at length be found over large portions of the globe, possessing just claims to a great antiquity, and thus proving an early wide dispersion of the human race, this would constitute a most striking harmony between what we regard as the teaching of Scripture and the actual discoveries of science.

But whether or not this lengthening of the chrono-

logy be allowed, we cannot admit that either the human race or the waters of the deluge were confined to the comparatively limited area within which some writers on the subject would confine them. On the contrary, both in its prophetic and descriptive portions, the language of Scripture would warrant us to conclude that, at the period of the deluge, the human race were both numerous and wide-spread. The late Dr. Kitto, though not contending for a longer duration of the antediluvian period than that assigned to it in the Septuagint, or longest computation, yet, from various considerations suggested by the Scripture narrative, he earnestly contends that the population of the world at the time of the deluge was probably nearly as great as it is now. And if, as we have been led to believe, the antediluvian period was even longer than that deduced from the Septuagint, then the considerations urged by this eminent Oriental and Biblical scholar, in favour of the wide dispersion of the human race, would possess still greater force; and, at the period of the deluge, we should be prepared to expect a wide peopling of the globe, and that thus mankind had largely fulfilled the Divine command to *multiply*, and to subdue and *replenish* the earth.

Any further remarks needed to illustrate this subject will find their fittest place in connection with the consideration of the present evidences of the deluge.

But another question was asked :—Where are the remains of the multitudes of men and of animals which

the flood swept away, or who perished by the action of its waters? In considering the probable effects of the deluge, this question cannot honestly be evaded. If the destruction of men and of animals was so sudden and universal as it is stated to have been in the biblical narrative, a large portion, at any rate, of their remains must be existing somewhere. And the great question now is,—Where would the deluge be likely to deposit them? In regions where such receptacles existed, it would doubtless float some of them into caves and fissures. Human implements, whether previously on the sites, or carried on to them by the action of the waters of the deluge, would be deposited along with beds of gravel, or with beds of sand and clay interstratified with such beds of gravel,—often, by their own weight, and in consequence of their sharp edges, sinking to the base, or near to the base, of such deposits, and would be found resting upon the more compact underlying strata. Then, but in much smaller numbers, human and animal skeletons would be thrown down in similar positions. Man and his implements, and remains of his slaughtered victims, would in some instances be found together. His home, or his refuge, would prove his tomb.

But would this largely take place? We think not. If, as we believe, many of the remains that have been found must be regarded as of antediluvian date, and must have been left and deposited during the antediluvian period, one thing is certain, that human skele-

tons, or fragments of human skeletons, would be much more rare than human implements. Bearing in mind the great age to which men lived before the flood, but few interments, as compared with the number of the inhabitants, would take place during the antediluvian period. Hence, in any deposit which was proved to be of antediluvian age, we should expect that man's implements would vastly outnumber his bones. Thus, the debris of the deluge, partly obtained by the denudation of antediluvian deposit, would contain comparatively few of the latter, while, in given localities, the former would probably abound. We should expect, also, that much fewer of men's own remains would be deposited in the gravels, sands, and brick-earths of our river valleys, than would be deposited in caves. Except, perhaps, in a few spots, the skeletons of the men and animals destroyed by the flood would not be likely to be deposited in the beds of sand or gravel which it would throw down; while a considerable number might be floated into caves, or be overtaken and destroyed in them by the rising waters. The beds and bars of rivers and littoral deposits would also become the grave of the men and beasts destroyed by the flood.

But if, owing to the great age to which men lived during it, the antediluvian period would yield but few comparatively of man's own remains, the number both of men and of animals destroyed by the deluge itself would be countless. And the question is,—Where are

their remains deposited? Those preserved in the modes already specified would scarcely be a fraction of the number that would be destroyed by the deluge. Where, then, would the remainder be deposited? Probably, as the waters retired from the face of the earth, a considerable number would be left exposed upon its surface, where, in a few years, they would, as a matter of course, decay, and every trace of them would soon disappear. Other bodies, or fragments of them, would probably sink down with the fine mud of the deluge, and be deposited along with it. But, except where it covered such remains to a considerable depth, they would not generally be long preserved in it; a few hundred, and especially a few *thousand* years, would probably obliterate every trace of them, or leave only a few friable fragments of the hardest and most durable of the bones.

But although these several causes would dispose of a large number of the remains of the persons and animals destroyed by the flood, still they would not account for all of them, and perhaps not for the far greater portion of them. Where, then, would be the solemn graveyard of the great majority? Where would the bodies of the full-grown sinners of the old world find their last sad resting-place? Where does the wrecked and sinking vessel entomb the crew who perish with it? Yes; we think of the profound depths of the ocean bed as most probably the tomb of a vast proportion of the perished antediluvian world

of sinners ! The restless howling waves of the sea, or its gentle murmurs, in all probability cover, not only millions of perished mariners, and of once fiercely-contending hosts of warriors, but also the perished millions of antediluvian men and animals.

We say probably ; and in support of this probability many considerations suggest themselves. It is a well-known fact that, after a certain time, the bodies of persons and of animals that have been drowned rise to the surface of the water, and float upon it for a considerable period, before they finally sink and remain upon the bottom. Decomposing in water, they become inflated with gases, and are rendered sufficiently buoyant to remain at its surface, and readily to move about with its waves and currents. Now, a vast number of such inflated animal and human bodies would, in all probability, float upon the waters of the deluge ; and, as those waters retired from the earth, they would bear these bodies away with them, and, in time, drop them into the depths of the ocean. And if this conclusion be a sound one, and we do not see how it can be disproved or gainsayed, it would lead us to expect that comparatively few of man's own remains would be deposited in the gravels and sands and brick-earths which form the superficial deposits of the earth. These deposits might contain the far greater part of the *implements* used by all the generations of antediluvian man, and by the persons who perished by the flood ; but with few exceptions, the remains of the men and

animals who thus perished would be drifted by the returning waters into their own ocean bed, and be interred in its secret and unfathomed depths. It is solemn to think of the millions which the ocean has swallowed up since the flood. But it is still more solemn to think, that it is in the highest degree probable that their silent watery grave is shared by a large proportion of the men and animals who perished by the flood!

We have now, as far as we deem it necessary, gone through the probable physical effects of the Noaic deluge. Assuming its real occurrence and miraculous origin as indisputable, we have candidly considered the results which would naturally follow from the action of its several forces. These forces we have not strained nor overstated, nor drawn from them any but legitimate conclusions. It is certain, that upon the most moderate calculation of its action, such a deluge as is described in the Book of Genesis would produce all the effects which we have attributed to it.

CHAPTER II.

THE PRESENT EVIDENCES OF THE NOAIC DELUGE.

CHAPTER II.

INTRODUCTION.

The present evidences difficult to decipher.—Because much modified and complicated by subsequent action.—Have they been discovered and misinterpreted?—Are the human and animal remains found in gravel and caves, a part of such evidence?—Why not?—Powerful water-action acknowledged by both parties.—This most important for the biblical solution.—One party has to obtain this powerful water-action by natural means.—It is supplied to the other by a Divine hand.—Both solutions have difficulties; but the biblical one the fewest and least.—The inquiry demands caution and modesty.—The evidence agrees far better with the physical effects of the deluge than with any operations of natural cause.—Other solutions both unlikely and inadequate.

It now remains for us to consider the present evidences of the deluge. Such evidences must exist somewhere. A world of organised beings could not thus perish, and leave no trace of the wreck behind. It may be difficult to decipher these evidences; it may be still more difficult to separate evidences due to antediluvian action, and to fluvial and diluvial action, that may have occurred since the flood, from those due to its own action; and perhaps most difficult of all, to assign to each force operating in the deluge its own share in the effects wrought; but that such evidences do exist may be most positively asserted. Have they, then, been discovered? Has the spade, or plough, or pick, of

man turned up any *relics* of this fearful catastrophe? Have its ancient and long-buried records been disinterred and deciphered? As such records most certainly must exist, have they been strangely overlooked? Or, if discovered and disinterred, have they been misread, and *perversely* misinterpreted? What if the implements and remains of man, and of his contemporary animals that have been found in our caves, in river and other valleys, on plains and slopes of hills, and in ancient and present river-beds, should be held to be the very remains of which we are in search? Why not? Admitting, as all candid believers in the truth of the Bible must do, the *scriptural* deluge and its legitimate probable effects, is there anything unlikely or unreasonable in this supposition? Is it either violent or farfetched? For, is there not a remarkable correspondence between the effects which the deluge would probably produce, and the evidences of some tremendous water-action that have actually been discovered? And if, by believing in the biblical deluge and in the effects which it would produce, he can fairly and satisfactorily bring all the remains of men and of his contemporary animals that have been found in the superficial deposits, within the period which the Bible assigns for the duration of man's existence on the earth,—what sincere and candid mind can hesitate to prefer such a solution, to the theories which demand his existence on the earth for some hundreds of thousands of years? Admit the occurrence of the deluge

(and we must remember that the fact of its occurrence not only rests on clear and express Scripture statement, but also on manifold and all but universal national tradition, as well as on striking monumental inscriptions), and we believe that the whole phenomena presented by our superficial deposits that have yielded human remains can be amply accounted for, and can be accounted for in an unspeakably more satisfactory and consistent manner than they can by any of the theories which only admit of the operation of natural causes. These may be regarded as bold assumptions; but ere closing we hope fully to substantiate them.

It is a *fact* which ought not to be overlooked, and which deserves the most serious consideration, that both parties in the case contend for the *action of the same agency*. In the schemes both of the divine and of the mere scientific geologist, *water in flood*—in powerful action—plays a most important and leading part. *Here*, so far as the general *fact* is concerned, there is entire agreement. With regard to the mode and amount of this action of water, geologists somewhat largely differ amongst themselves; but all of them, not less than the diluvianist, urge that water has been the main instrument, both of denudation and of deposition. This is so obvious to all who examine the subject, that it is with all parties a settled point. But while, by largely referring them to the manifold action of the Noaic flood, one party can bring all the deposits in dispute within the biblical period; the

other, denying or ignoring that flood, and determined to attribute all the phenomena to the operation of natural causes alone, is obliged to demand, not only hundreds of thousands of years for that operation, but has also to summon to his aid an immense amount of pluvial or sub-aërial action, which it is extremely difficult to suppose ever existed, or ever could exist, in the areas where these deposits are found. Giving to the one party the data supplied by the biblical deluge, and a duration of from eight to ten thousand years since the creation of man upon the earth, and with this data he can account for all the superficial deposits that have yielded human remains; while the other, *excluding* the deluge, must demand for their deposition, *on the sites where they are now found*, a multitude of unlikely forces, and periods of time truly fabulous in length! Both attribute stupendous, gigantic, and very manifold effect, to the action of water; but one to water as *impelled by a Divine hand, to accomplish a great and worthy Divine purpose*; the other to water acting according to the operation of natural cause; and hence the latter have to *suppose*, both the powerful and prolonged operation of that cause, on grounds which we cannot but deem utterly insufficient.

But the agreement of both parties with regard to the principal agent in the case we hold to be most important. Had the advocates of the respective modes of solution *started* from opposite points, and with the

action of different agents, this would have constituted a very grave, if not an insuperable difficulty. And we think that it says much in favour of the diluvian solution, that its opponents regard its great agent,—long and stupendous water-action,—as the principal factor in their own theories. *Water* has eroded, or scooped out, our valleys and river-beds; *water* has largely or wholly filled up our caves and fissures, and modified and reassorted many of their contents; *water* has thrown down our gravels, sands, and brick-earths; *water* has buried the implements and remains of man and of his contemporary animals; and *water* has taken up in suspension, and borne away, and widely spread out the loess, or fine inundation mud, which so largely covers the face of the earth.

How the geologist obtains these several materials, and how he succeeds in bringing on to the scene the amount of water requisite to *supply*, to *drift*, and to *disperse* them, are very different, and we believe most difficult, questions to answer. The humble and intelligent believer in his Bible is, and can be, at no loss for the origin of either the one or the other. A *Divine* hand supplies the needed “flood of waters”; and a *Divine* hand impels them to “cover the whole earth.” Breaking up “the fountains of the great deep,” and “opening the windows of heaven,” “for forty days and forty nights,” the Omnipotent Judge “overwhelms the earth with a flood of water,” destroying from off it a sinful race, and entombing a perished world

beneath the debris of its own wreck! Here there is perfectly *adequate* cause, and here is truly *legitimate* effect.

But it will be justly demanded,—*With which solution does the evidence obtained and examined best agree?* We are perfectly willing to abide by the result of this test. The answer which a full and candid examination of the evidence is found to yield, we shall fearlessly embrace. On this point we at once join issue with the advocates of “man’s extreme antiquity.”

That both schemes of solution may involve *some difficulties*, and partially leave some facts unaccounted for, we are at once prepared to admit. But this may be largely owing to our limited knowledge, and to our limited field or powers of observation. The phenomena embodying the evidence to be examined is, on the lowest calculation, truly ancient, and has, for some six or it may be more thousand years, been subjected to a variety of modifying influences. Much of the evidence existing at first has been changed, and much has probably been obliterated. Oscillations of land above the sea, earthquakes, volcanic action, local floods, and general elemental action, have in all probability wrought much change in our superficial strata, and have thus greatly increased the difficulty of reading the evidences which they supply.

Then to reassemble and remarshal the forces operating in the deluge, or those to which the mere geologist attributes all the phenomena in dispute; and to con-

ceive how each force would act, and what would be the result of the action of all the forces, both single and combined,—is a task unspeakably surpassing all human power and genius. Could we rise to the conception of the grand product, separating and defining the action of each agent, trace to each agent its own effects, or *their* effects to any two or more factors operating together; and, finally, could we discover and note each change and modification and obliteration which may have occurred during the space of the last six thousand years,—then we might be found more equal to the task of reading off the evidence, and determining the signification of the facts which the Post-pliocene, or superficial, deposits of the earth present to our gaze and for our investigation.

As, however, no human mind, however lofty in its powers, or however trained to thought and observation, can be equal to this task, it surely becomes each investigator to preserve an unfeigned modesty, and to deal, not in dogmatic, but in cautious assertion. Remembering, indeed, that the most minute and extensive observer, that the best generaliser and classifier of facts, and that the most expert in tracing effect to its cause, must still have only a very limited knowledge of the *whole problem* to be solved, we cannot but deem it, not only utterly unphilosophical, but also arrogant, to attempt to settle the supremely important questions involved, in the curt and imperious tone and manner which some have adopted in the case. And we urge

that such a course is specially to be reprobated when the asserted settlement involves the denial of express scripture statement, and is met in the face of it by widely extended national tradition and monument. Believers in the "old fashioned Book" may be sneeringly pitied as greatly behind the advanced knowledge and science of the age, and as holding ancient faiths and dogmas long since exploded; but still it must be admitted that in modesty and cautious statement, at all events, they are equal to those who venture to denounce them. But these are matters which we must leave to the reader's own reflection.

Persuaded, indeed, that no solution, *though it may be the true one*, can now entirely meet and remove every difficulty, or fully account for every fact, we shall content ourselves with endeavouring to ascertain *what solution* involves the least of difficulty, and what solution will account for and *cover the greatest* number of the facts embraced by the phenomena to be investigated. If, in addition to the argument for its actual occurrence supplied by Scripture statement, and by national tradition and monument, we can also show that the deluge will better solve the difficulties and better account for the facts presented by the superficial deposits that have yielded human remains, than will any of the theories which attribute the whole formation of these deposits to the sole operation of natural cause, and which demand for the human race an antiquity so enormous; then, surely, no sincere and

truth-loving mind, however greatly the savants of science may pretend to commiserate its narrow weakness and ignorance, can hesitate to hold fast "the old beliefs" in that deluge. That the biblical solution may leave some difficulties partly unexplained, and that it may fail fully to account for every fact, is what the nature of the case would prepare us to expect. But we submit that the great question to be solved in the case is not: Will any solution yet broached explain everything and account for everything? But: Which solution leaves the *fewest* difficulties unexplained and the fewest facts unaccounted for? Were even the respective solutions *equal* in this respect,—did one solution comprehend the whole evidence as fully as the other,—no believer in the truth of the Bible could hesitate to give the preference to that one which was found to be in entire harmony with its own statements. In a case where two opposing witnesses, equally competent and equally worthy of credit, gave a contrary testimony, no jury in the world would hesitate a moment to give the verdict in favour of the one whose testimony was found to be supported by a well-accredited written document.

But in the case before us, we are prepared to go much beyond this. We hope to be able to show that the evidence presented by the superficial formations of the earth is vastly more in favour of the solution which the biblical deluge supplies, than it is of any of the theories which are hostile to Scripture statement. In

other words, we are prepared to prove that the probable physical effects of the Noaic deluge agree far better with the phenomena actually presented, than would the effects which would be produced by the causes which the *anti-diluvian* has to summon on to the scene to produce them.

Nor is this all: against the actual existence of the causes supposed to have produced the evidence, we have two grave objections to urge:—They are unlikely to have existed on the *scenes* demanding them; and, if they existed, they are inadequate to effect the complicated phenomena attributed to them. If these two objections can be at all substantiated, our task, we imagine, will be half accomplished.

THE EVIDENCE TO BE EXAMINED AND TESTED.

This, perhaps, is the proper stage to state the evidence to be examined and tested. What does that evidence embrace, and where is it to be found? It consists of a widely-dispersed “diluvium,” or, as it has been called, “inundation mud”; of immense deposits of “brick-earth”; of so-called “high and low level gravels,” with their intervening beds of sand or clay; of deposits on the beds and by the sides of rivers; and the contents of fossiliferous caves and fissures. These several deposits compose the superficial beds known among geologists as Post-pliocene, or Pleistocene, or Quaternary.

SECTION I.

THE LOESS.

This formation described.—Sir C. Lyell's account of it in the valley of the Rhine.—“Inundation mud.”—What was its origin, and how was it thus distributed?—Sir C. Lyell's theory unsatisfactory.—As much so as the lake theory which he discards.—Glacial origin.—Difficulties involved in this supposition.—Not more certainty in the supposed repeated elevations and depressions required for its distribution.—Geologists have not paid much regard to this deposit.—Papers upon it by Mr. Trimmer.—The agreement of his statements with its diluvian origin.—Important paper upon the loess by Rev. O. Fisher.—His theory on this “warp.”—The grave difficulties besetting that theory.—But the phenomena which he describes strikingly correspond with the effects which would be produced by the Noaic deluge.—Natural cause not ignored.—Other theories fail to explain the evidence.—The evidence confessedly exists.—The diluvian one tested.—Would both collect and distribute this fine mud, and deposit wherever it is now found, and would denude it as now denuded.—It renders the cumbrous apparatus of other theories needless.

The loess, as the diluvium, or inundation mud, is called by the German geologists, is found almost everywhere, either in patches, or covering extensive plains and valleys, forming, in fact, a large portion of our fine siliceous and loamy soils. Except where it has been swept away by denudation, or has evidently been covered up by more recent fluvial deposits, it constitutes the surface of the earth, and forms the superior

or highest portion of the Pleistocene formation. Taken in its entirety, the quantity of this "warp," or "inundation mud," is immense. In deposits of less or greater thickness, it overspreads most of the regions of the earth; and has, at any rate, been found wherever remains of man and of his contemporary animals have been found. According to Sir C. Lyell it varies from a few inches to as much as two hundred feet in thickness. The description which he gives of it, as spread out in the valley of the Rhine, is also more or less true of it throughout the whole extent of its wide dispersion. He says, "It is a remarkable deposit, from its position, wide extent and thickness, and fresh water (?) origin. Its distribution clearly shows that after the great valley of the Rhine, from Schaffhausen to Bonn, had acquired its present form, having its bottom strewed over with coarse gravel, a period arrived when it became filled up from side to side with fine mud, probably deposited by inundations (?); and it is also clear that *similar mud and silt* were thrown down *contemporaneously* in the valleys of the principal tributaries of the Rhine." The fact is, that everywhere it is distinguished by marks of contemporaneous origin.

Two questions now present themselves to us: viz., what was the *origin* of all this finely pulverised material? And by what *agency* was it thus widely distributed? The advocates of man's extreme antiquity assign it, of course, to the operation of natural causes;

but, in doing so, considerably differ among themselves. Their solutions agree in little, except in the one point of great antiquity.

In his later works and editions, Sir C. Lyell appears to regard this inundation mud as having been largely produced by the crushing and pulverising power of glaciers and of extended sheets of thick ice, and its distribution as having been effected by river inundation, acting on a succession of different levels, and its present varying depth to subsequent denudation. He dismisses at once, as altogether unequal to the effects, and as quite inconsistent with the facts of the case, any form of *lake* theory, to the bursting of whose barriers some geologists had attributed its deposition and subsequent denudation. But his own *theory* with regard to the supply of the loess, and the *repeated* elevation and depression of the regions, if more consistent with itself, has this grave defect, that it *lacks all* proof. *Grant* him his assumed data, and then perhaps his conclusions might follow from it. But all the data required in the case have really to be supposed.

Further, if glacial and ice action be supposed to have originated this fine mud, then it is fair to ask, *where* was it reserved during its gradual production throughout the prolonged Glacial epoch, and during the enormous periods of time supposed to have been required for the deposition of the sand and gravels on which it everywhere rests? It must be remembered that the Glacial period *preceded* the so-called Quaternary one.

Hence, during the time that all the valley gravels, brick-earth, and cave deposits were being formed, this mud (if the theory of Sir C. Lyell be true) must, somehow or other, have been stored up somewhere for hundreds of thousands of years, ready for distribution when the period for its deposition on its present sites had arrived! Surely such a theory, with its crowd of suppositions, fails as signally as the lake one which Sir C. Lyell so summarily dismisses.

Then where is the proof that any amount of glacial action would produce the immense quantity of mud required in the case? What proof, moreover, have we of the repeated elevations and depressions which the theory demands? Then they must not only be supposed to have occurred in this German area, but in most of the regions of the earth. Then proof of *successive* river inundation is equally wanting. Further, how could *successive* inundations produce *one* "remarkable deposit"? We cannot but feel, indeed, that both the *origin* and the *distribution* of this fine mud are ascribed to causes which have mainly to be supposed, and that, even were they granted, they are utterly inadequate to produce the effects attributed to them. We imagine, indeed, that the thoughtful reader will regard as truly wonderful the slight and feeble grounds on which scientific men embrace and uphold theories, which, whether designed to be so or not, are really hostile to the teachings of the Bible. And, lest any persons should suppose that we have misrepresented

the opinions of this distinguished and now venerable geologist, we advise them to read for themselves his remarks on the origin and distribution of the loess, in his "Elements of Geology," and in his work "On the Antiquity of Man."

From the generality of geologists this deposit has received but little consideration. In his papers on the soils of Kent and on the geology of Norfolk, the late Mr. Trimmer remarks: "The majority of soils and subsoils in the British Isles are composed only in part of the debris of the rocks on which they rest, and in part of materials *transported* from various distances by *forces of considerable intensity*, differing from ordinary atmospheric action, which were in operation at the close of the period. I have called these results the warp of the drift, or erratic warp." "It appears to have been a deposit from *turbid waters* returning to a state of tranquility."

We shall not *now* stay to point out the perfect agreement which obtains between these statements, and the probable effects which the waters of the deluge would produce during the one hundred and fifty days of quiet, when the fine mud, with which they would be so largely charged, would be thrown down on the face of the earth. Nor is the supposed inconsistency between the different statements made by this author at all at variance with this conclusion. The deluge, in its twofold force of broken up fountains and of torrential rain, being *everywhere local* as well as

general, would be sure to mix local materials more or less with those which its waters had transported from a less or a greater distance. Then as to the objection grounded on the fact that the *thinnest* portions of this deposit are those which contain the largest amount of local material, it is sufficient to reply that apart from the mixing power of local or general denudation, the operations of agriculture, and the burrowing action of the common earthworm, amply account for the larger mixture of local materials in such thin surface soils. It has been shown that the common earthworm, by its burrowing action, really turns over a large portion of the surface of the earth every few years. We regard Mr. Trimmer's views, therefore, as in substantial agreement with our own. Not that he names the deluge. The fact is, he does not attempt to specify the forces which he supposes must have been in operation in the case. But the *intensity* and transporting power of the forces, and the action and effects which he attributes to them, strikingly correspond with those of the Noaic deluge.

The later theory of the Rev. O. Fisher on the "*warp*," we regard as both imperfect and unsatisfactory. As far as our space will admit, we are anxious to give a fair representation of it, and to do it all possible justice. The reader will find Mr. Fisher's paper on the subject in the twenty-second volume of the *Quarterly Journal of the Geological Society*, and at page 553. He regards the "*warp*," on which, as Mr.

Trimmer remarks, the fertility of our fields largely depends, as derived from materials that had been previously deposited in depressions, and especially in what he calls "furrows,"—chasms or gullies,—that had been ploughed out and filled up again by denuding and re-depositing forces, which had finished their action before the warp itself was spread out. The materials in these filled up furrows he calls "trails," and remarks that they have been kneaded and pressed together in the furrows by the action of some powerful force. "The position," he observes, "of the pebbles in the trail, and still more so the contorted but unassorted condition of incoherent material, show that the trail has been transported in a plastic state (as mud), moving by its own gravity, or else *pressed onward by some other agent.*" "I can cite instances which prove that considerable force has been involved in the process. In a railway cutting near Wivenhoe, in Essex, I found, at the side of a valley, one of these furrows in the London clay, about thirteen feet deep, filled with such sand and gravel as caps the table land around. The clay, for a thickness of four or five inches, was kneaded into a plastic state, laminated, and full throughout of polished surfaces of slickensides, showing that the 'trail' which filled the furrow had been pushed forwards under great pressure, and had carried forward with it the surface on which it rested."

What this pressing and pushing force was, and *how* it was obtained on all the areas in question, he fails to

tell us. But the thoughtful reader will not fail to observe, how strikingly both the *force*, and the effects which Mr. Fisher attributes to that force, correspond with the forces acting in the Biblical deluge, and with the effects which, as we have seen, those forces would produce. First, as its waters rose, and prevailed over the earth, and then, again, as they returned from off it, many such "furrows" would be produced in all the deposits which then formed the surface of the earth, and would, during the manifold action of the deluge, be filled again with the strange medley of materials now found in them. But that the "warp," or surface soil, so largely covering the face of the the earth, was formed by the destruction of the "trail," or materials contained in these furrows, and by the mixing of those materials with such as were supplied from local deposits by elemental and worm action, assisted by vegetation,—we cannot see the shadow of a proof. The fact is, that in this theory, as well as in that of Sir C. Lyell, so much has to be supposed, and so much has to be taken for granted, and after all the solution is so inadequate, that apart from any bearing it might be supposed to have on Scripture statement, we should feel compelled to reject it altogether.

We are sorry to speak thus of the theory of one whose paper proves him to be a most careful and able observer, and whose descriptions of geological phenomena are as clear as they are faithful and accurate. To be able to agree with such a writer would afford

no ordinary degree of pleasure; but fidelity to the cause of Divine truth, as well as to scientific fact, compels our disagreement. The able summing up of his paper, which we beg to give *in extenso*, would oblige us to come to conclusions entirely differing from his own; and would form one of the best foundations which we could desire, on which to base the solution supplied by the biblical deluge. Nothing but the *italics* are ours.

"We have, then, data for fixing the period of the formation [of the warp over the surface left, in all probability, in a bare condition by a *preceding general* denudation. It was subsequent to the period when the Elephas primogenius lived in company with E. antiquus, and when chipped implements were used; (?) for the gravels which contain these associated relics have been affected by the denudation which preceded the formation of the warp. But it was previous to the growth of the newest submarine forests, which occupied the surface before the last depression of the land." "Upon reviewing the changes which have been indicated by the phenomena discussed in the present paper, we have disclosed, in the first instance, a condition of the surface when the general features of the landscape were the same as at present, during which the great mammalian fauna flourished contemporaneously with the fabricators of the chipped flints."

"We have subsequently, though perhaps not in

immediate sequence, a period of extensive denudation, indicated by the furrows filled with materials from the higher grounds (?) which have *travelled in a plastic state*, and which I have called 'trail.' This denudation brought the surface almost exactly to its present form. The *period* of the formation of the warp *succeeded*, in which the winter frosts *seem* to have been more severe than at the present time."

The remaining concluding remarks of this able paper do not affect our present inquiry, and are therefore omitted.

But that the phenomena, so ably and faithfully described by Mr. Fisher, strikingly present the *evidence* of which we are in search, as corresponding to the effects which would be produced by the Noaic flood, is, I think, indisputable. The extensive *denuding force*, the *pressing* pushing agent, the scooping *furrowing* power, the *transporting* cause, the *plastic* state of the materials transported, the depositing of these in the furrows, and the final enveloping of the whole with the "warp," the manifold machinery which Mr. Fisher has to suppose,—are all supplied by that flood. In this solution nothing has to be supposed, and nothing has to be attributed to farfetched and inadequate cause.

Then it has this additional advantage: that it does not oblige us either to deny or to ignore the action of any subordinate agency that may have played a part in the production of the phenomena brought before us

in the paper under review. But while quite consistent with the diluvian theory, they are utterly inadequate *without it*. They may have assisted and modified the effects; but even if Mr. Fisher *had proved* the existence of the forces to which he attributes these effects, instead of having to *suppose them*, we confidently assert that they could not have produced them.

We are not aware that any other theories are held on the subject of the loess; except so far as such theories form a part of wider ones, which embrace the denudation of our river valleys, and the deposition of the sands, brick-earths, and gravels, that are found in them. Hence the discussion of these can be best undertaken when we proceed to the direct consideration of such deposits.

It now remains to test the *evidence* supplied by these and similar examples, by the solution which the Bible affords. How far does this evidence of powerful and extensive water-action correspond with the effects which we have shown would most probably be produced by the Noaic deluge? It has, I imagine, been shown, that all other theories fail to account for the existence and for the wide distribution of this fine inundation mud. As Sir C. Lyell justly contends, its existence on elevated sites, on hills and wide plains, is altogether fatal to any lake theory. But his own theory has been shown to be equally imperfect and unsatisfactory, and to be equally fraught with the seriously damaging element of supposition. The

theories of others, either leave much of the evidence unnoticed and undeciphered, or have to summon to their aid causes which have the grave defect, that they are both unlikely and inadequate. On all human theories, as yet, at least, the so-called "warp," the "loess" of the Germans, the fine "inundation mud" of others, so largely forming our loamy surface soils, remains an unsolved problem: *it has yet to be accounted for and explained.*

The evidence to be read and compared exists. Its existence is undisputed. Thus the *data* forming the problem to be solved are substantially the same in every solution of it that has been attempted. By whatever name it may be called, and to whatever cause or causes its production may be attributed, this inundation mud is *started with*. We have not to suppose it, or to summon it into existence, for the purpose of obtaining an evidence which might be found to correspond with the effects which the Noaic deluge would produce. *It confessedly exists.* We have the actual evidence, and an evidence which, with a marvellous accuracy, corresponds with that which the effects would lead us to expect. The gradual deposition, by the waters of the deluge, of the finer and lighter materials which they had taken up, and which they held in suspension over all that portion of the globe which they covered, will fully account for all the facts to be explained, so far as the origin and general distribution of the loess is concerned. At the first, and

before any of it was parted with, the amount of mud thus held in suspension would be incalculable.

Then in the stupendous and manifold action of the deluge itself, we have a cause abundantly adequate to *produce* or, where it previously existed, to collect this vast mass of fine and once plastic material. And then, remembering that the waters of the deluge rose to a height of some twenty-three feet above the highest mountains, and that consequently their depths in the valleys and low-lying plains would be very great, one hundred and fifty days do not seem too much to allow the turbid waters to part with their muddy contents. Over the more elevated portions of the globe, and where the waters were consequently of comparatively small depth, they would soon become clear; and hence the amount of "warp" or mud thrown down on such portions, though covering all their irregularities of surface to a nearly equal depth, would yet be comparatively thin; while in deep depressions and valleys it might amount, and probably would in some instances amount to hundreds of feet in thickness. And this, as Sir C. Lyell and others have shown, is just what the evidence in the case presents. Except where it has since been swept away by denuding forces, the loess is very generally distributed. It rests on elevated plains, and, where there was anything to protect it, high up on the sides of valleys, and far away from any present river-courses. Then it varies in its thickness in the very manner which the diluvial solution demands

that it should vary. Most frequently it is from a few inches to twenty or forty feet in depth; but sometimes, as in the examples mentioned by Sir C. Lyell, it has a depth of as much as two hundred feet.

At the same time, it curves over and around every irregularity of surface, just as mud thrown down from still water would necessarily do. Any seeming exception to this state of things, as we shall soon see, has been caused by the action of the waters of the deluge as they retired from the earth, and by subsequent denuding and modifying agencies. And allowing for these, there is entire agreement between the probable physical effects of the deluge and its present evidences, as far as those evidences are supplied by the last of the Quaternary deposits. The *cause* is equal to the effects that have been discovered; and the effects that have been discovered are such as the cause would necessarily produce. No solution could embrace more, for no solution could more be reasonably coveted. Had we, indeed, both the cause and the effect, and both the effect and the evidence, to create or imagine, we could not forge, and could scarcely conceive of, an agreement more complete. Considering, in fact, the great length of time that must have elapsed between the action of the cause and the finding of the evidence, and the many modifying influences that have been at work between the two, the agreement almost seems too perfect to be admitted.

Hence, what really candid mind can hesitate to

prefer and hold fast the solution of the phenomena which the book of Genesis supplies? Even altogether apart from its Divine authority, the believer in the Bible must feel that the account which it gives him of the Noaic deluge furnishes unspeakably the best solution of the facts which geologists have collected respecting this loess deposit, *and leaves nothing to be supposed*. The cumbrous operation of glaciers, of alternate elevations and depressions, of repeated floods and inundations in limited localities, and of questionable elemental action, which other theories have to suppose, can all be entirely dispensed with. Given as the data of the problem, the legitimate action of the deluge, and the wide distribution of inundation mud actually found existing on the face of the earth, and to us that problem appears of easiest and readiest solution. *At present* we seek no other. Should scientific men hereafter discover what they deem to be a better solution, we shall, when they present it to us, candidly examine its claims to reception; but until such a discovery is made, we shall hold fast the biblical solution just stated, fully assured, not only that it is the *inspired*, but also unspeakably the most reasonable and complete one.

IT ACCOUNTS FOR EXCEPTIONAL FACTS.

It accounts for the fact that but few human and animal remains are found in the loess.—Thrown down when the waters were quiet.—Successive floods could not account for this.—Accounts for a few exceptional older remains.—The doubtful data on which man's antiquity is carried back.—The mode of this deposit accounts for recent-looking fresh-water shells of local species.—This example makes against the theory of man's extreme antiquity.—Men's strange notions of the deluge.—That deluge local as well as general.—The absence of marine shells in the loess explained.—The loess proclaims the biblical deluge, and fully accords with its effects.

THIS solution also accounts for what might be regarded as exceptional facts; such, for example, as are presented by the comparative absence in the loess of the remains of man and of his contemporary animals. If thrown down from the waters of the deluge during their state of quiet, this is just what was to be expected. With the exception of a few inflated bodies, which might settle down along with the fine mud, all heavy bodies, such as flint implements and bones, would have been previously parted with, and have been deposited in the beds of gravel. The few exceptions which might occur have been actually found. The loess has yielded some few implements, and also some few human and animal remains; and this is especially the case if we regard, as probably we ought, some of the brick-earths as belonging to this deposit. We should not, however, be surprised to find them in

greater numbers in some localities. Even if not deposited in it when first thrown down from the waters of the deluge, they might, and probably would, become imbedded in it by the denudation occasioned by its returning waters. During this operation, much of the inundation mud would be removed, and also portions of underlying deposits, and the mixed materials thus obtained would be drifted together, and be redeposited in some new locality, forming a mass undistinguishable from the loess, and yet containing a larger proportion of fossil remains than originally belonged to that deposit. Our solution thus meets the whole difficulty; but we cannot see how it can be met on any theory of repeated elevation and depression, nor how any *succession* of inundations, even if granted, can account for the facts. Nor is this the only difficulty which such theories cannot solve. *The loess is one deposit.* Would a succession of violent inundations, acting on an alternation of levels, produce one homogeneous deposit? The theory of successive inundations requires that immense floods, covering an enormous lapse of time, shall throw down nothing but fine mud. That portion of their action which deposits beds of gravel and sand must be eliminated from them. These repeated inundations must obediently do the bidding of the theoriser; so modifying and marshalling their action, that for thousands of years together they shall suspend, by some magic miracle, their power to deposit all coarse material, and throw down nothing.

but fine inundation mud. Can such theories be seriously, can they be rationally, embraced? But take the one stupendous and mud-charged deluge resting upon all the earth, and parting with that mud for a period of 150 days, and all is clear, and as rational as clear.

Then this solution also meets another seeming difficulty which the evidence presents. We allude to the *few doubtful remains*, which have been referred to Pre-glacial or older periods of past time; and which, because found along with the remains of animals contemporary with man, are supposed to carry back the appearance of man to these older epochs. The manifold action of the deluge was abundantly equal to produce such examples. It would, in many cases, denude the surfaces of such older deposits, and cut deep furrows into them, and wash out animal remains from them; and then redeposit them, along with its own debris, at first in beds of gravel or coarse sand, and then in the form of fine mud. And thus the remains of animals, not only of Pre-glacial and of Pliocene age, but even of more ancient epochs, might be found in what seems *undisturbed* loess, or brick-earth, along with the remains of animals, some of whose later generations, at least, were contemporary with man on the earth; and on this *apparent* evidence an antiquity might be ascribed to man immeasurably greater than his actual one. But so long as man's own remains are not found in *undoubted, undisturbed*, Pre-glacial or

Pliocene strata, where no surface-action could have deposited them, and where they could not have sunk down through softened beds by their own gravity; the mere fact of animal remains from such older strata being found along with those of Post-glacial epoch, and even along with those of man himself, does not afford a shadow of proof for man's asserted extreme antiquity. Nothing is more natural than that the Noaic deluge should produce many such examples of association of old with newer remains. And as such association may have existed for some six thousand years, the deposits presenting them would of course appear to be undisturbed.

At present, we believe, the examples of such association that have been discovered are very few. But if, in the end, they should prove to be numerous, the above considerations would satisfactorily account for them, without supposing for man any greater antiquity than the Bible admits. And we must also remark, that to attempt, *on such slight and most doubtful data*, to carry back man's existence on the earth to an epoch which must date some millions of years in the past, can only be regarded as sheer recklessness, and as evincing a determination, at all hazards, to reach a foregone conclusion. Did the solution afforded by the Bible rest on any such *airy* basis, and involve so many *more* than doubtful elements, we should feel utterly ashamed of it, and discard it for ever; persuaded that the record that furnished such a solution could never

h-water shells are light in their structure, and would thus, from the first, be likely to be floated on waters of the deluge; and would, when those waters became quiet, be also likely to be dropped in a perfect state along with the diluvian mud, to be deposited along with it.

But supposing the objection were at all valid, it would not only tell equally, but more than equally, against the theory of the objector; his own solution of repeated inundation, not only involving the very difficulty that he alleges against the Noaic deluge, but a difficulty more insuperable. If the flood of Noah had broken all these shells into fragments, *acting on the scale supposed for them*, so must powerful local inundations; and *much more so*, as stated inundations; which, taken together, shall be in volume to one grand one, would effect greater destruction of the shells, than a solitary one, however small, would accomplish.

But be this as it may, we cannot see how the biblical deluge would necessarily destroy the land and h-water shells that were subjected to the action of waters. It would doubtless destroy many of them, especially those deposited along with its gravels and finer sand; but those deposited along with its inundation mud would, for the most part, be perfect; and, found at considerable depths in the deposit, might be quite fresh.

But, while the fact here stated forms no valid objec-

tion to the diluvian origin of the loess deposit, it does form an objection, and a very weighty objection, against the great antiquity claimed for this deposit. If the shells found in it are so perfect and *fresh-looking* as is asserted, the evidence, we should conclude, does *not* point to a very *ancient*, but, on the contrary, to a recent origin. And thus, again, the objection is not only found to be destitute of any force, but it also becomes a *proof*, both for the deluge, and its comparatively recent occurrence.

There is also another fact closely connected with the preceding, further urged as an objection to the diluvian theory. It is asserted, and we see no reason to dispute the correctness of the assertion, that the shells are largely of local species, and thus of local origin; hence it is justly urged, that the majority of them cannot have been transported from great distances, as must have been the case, had they been deposited by the waters of the deluge. But this objection is founded on utter misconception; and would never have been urged, had its authors carefully considered the language employed by Moses in describing the Noaic deluge. More than one half, indeed, of the objections that have been urged against the deluge, are immeasurably wide of it, and lie not against the deluge itself, but against men's own misconceptions of it. *Where*, in fact, the majority of geological writers, who deign to notice it at all, have obtained their notions of the deluge, we are utterly at a loss to divine. What really seems to be float-

ing before their mental vision, when they are referring to the subject, is some one stupendous wave sweeping over the whole earth, of great magnitude and height, but of brief duration. This wave, too, they appear to assume, takes its departure from *one point*, or centre, and moves onward in *one* direction. But this is not the biblical deluge, but a monstrous parody upon it of their own creating! Against *such* a deluge as this, all their objections would be valid; and they might add a thousand more. But then such a deluge is their own mental offspring, and has no relation to the beautifully rational and Divinely described deluge of the Bible. The one is an *imagined monster*; the other has been placed before us by the unerring pen of Divine inspiration.

For the difficulties besetting *such* a deluge, we refuse to hold either ourselves or the Bible responsible. Let those who from the depths of their fancy have conjured up such a deluge, overwhelm it with objections as soon as possible; we shall neither try to save it, nor mourn its everlasting interment; the sooner they sing its requiem the better.

Let us now proceed to show how *the one deluge* of the Scriptures meets the objection, and solves the difficulty. The problem to be met is, that the loess contains a large number of perfect and recent-looking freshwater shells, for the most part of local species, and therefore of local origin. Their perfect condition has already been accounted for; and their *recent* aspect has supplied us with another argument in favour

of the comparatively recent origin of the deposit itself. Nor do the other portions of the problem present us with any greater difficulty. That the shells found in the loess, are, for the most part, of local species, and thus of local origin, is what we are prepared to expect. The account of the deluge given us in the book of Genesis, gives no countenance to the supposition so widely entertained, that it consisted in the action of one or more great waves driven over the face of the earth. On the contrary, while general in its entire action, *it was also everywhere local*. The rain fell on the whole earth,—as far as the deluge extended, and on every particular spot of that earth,—*simultaneously*. And if the breaking up of the fountains of the great deep, and the rush of waters from them upon the earth, appears at first sight, to be an exception to the strictly local character of the deluge, this seeming exception would not much affect the general result. Such fountains, though in a somewhat wider sense, would themselves be *local*; then their tendency to sweep in wave form over the earth would soon be met and neutralised by the waters supplied by the descending torrents of rain. We should thus have a deluge of stupendous general action, but at the same time, largely producing local effect and local deposit.

In fact, the correspondence between the physical effects of the Noaic deluge, and the evidence of some such deluge supplied by the loess deposit, is so *minute*, and consists in so many particulars, that we might almost

be tempted to regard the biblical account, as having been forged to meet it! But for the statement in Genesis, that "the waters of the flood were upon the earth for one hundred and fifty days," we should have been unable to account, either for the loess itself, or for the large number of perfect shells of local species which it contains. Nothing but this long quiet of turbid waters, holding local shells as well as mud in suspension, could deposit the extended and thick mass of fine material which the loess presents. Had it been asserted, that the waters of the deluge began to return from off the earth, as soon as they had reached the highest point above its mountains, no such phenomena could have occurred: for the returning waters would have borne both the mud and the shells which they contained along with them, dropping them at length into their own final ocean depths. It is to the local, as well as the general action of the deluge, combined with the lengthened quiet of its intensely muddy waters, that we owe the peculiar assemblage of facts united in this loess deposit.

We shall not stay to point out the difficulties besetting all other solutions of this phenomenon yet devised. We have no wish to push the advantages gained by our own solution over those of others any further. We are quite content to have shown, that the facts which have been urged as objections against the diluvian solution,—so far from really forming objections to it,—constitute some of its strongest proofs, and supply that minute and

manifold coincidence, which no forgery can imitate, and which can only have its foundation in absolute truth.

But while, in several respects, the deluge was strictly local, and would therefore largely produce local phenomena, it was also general. It was the *same flood of waters* that prevailed upon the whole earth; hence exceptions to strictly local phenomena might be expected to occur. Both shells and animal remains would, in some cases, be transported from a distance; and the fauna of different zones of latitude and of different countries, might, in much smaller numbers, be thus found mingled with those which were of local origin. That this would occasionally occur may be most positively assumed; and thus the presence in the loess of any foreign elements, whether mineral or fossiliferous, is amply accounted for.

There is, however, another point deserving of a few remarks: *That the loess contains few if any marine shells.* Now, it may be argued, that upon any hypothesis this could not have been the case, had the waters "of the great deep" been poured out on the earth. For, it may be urged, that even admitting that the oceans were emptied on the earth by the process of evaporation and rain, yet as all the various waters, both from the sea, and those supplied by the rain, would soon be blended together, they might still be expected to deposit some marine remains in localities distant from the previous ocean beds. We have endeavoured to state this objection as strongly as possible, and to bring

out in the most prominent light the difficulties which it is supposed to present to the diluvial origin of the loess. But although, as thus stated, it looks formidable, yet it is by no means insuperable.

In fact, that the loess would contain few marine remains, is what we should expect. Even taking the objection in its strongest form, and allowing that the breaking up of the fountains of the great deep means, that the open oceans poured their waters upon the earth, drifting a large number of marine remains along with them,—even then these remains would not be found in this *fine inundation mud*. Not only must such marine remains have been comparatively few from the first, but as marine shells are generally much stronger in their structure, and therefore heavier, than are land and fresh-water ones, any that might be drifted by the broken up waters, would sink down along with the coarser materials, and would be deposited, not in the loess, but in the gravels or heavy sands which are found beneath it. With this answer, we might take our leave of the objection; as the facts thus stated, would, if such were really the case, be sufficient to account for the entire absence of marine shells from the loess deposits.

But justice to our theme demands that we look also at the objection in its weaker form. It is possible, of course, that the interpreters who regard “the fountains of the great deep” as vast internal reservoirs of water, are correct; and the breaking up of these fountains, and their discharge on the earth, would not

involve (as they could not contain any) the drifting of any marine shells on to the earth. And even admitting that the open oceans also parted with their waters to cover the earth ; yet, as a two-fold breaking up cannot be allowed in the case, this must have been effected by *evaporation*, which, of course, would leave all heavy bodies behind. Nor would this involve the destruction of the marine fauna. For the language of the Scripture gives no countenance to the supposition that the fountains of the great deep were entirely emptied of their contents, and that their beds were left bare and dry. On the contrary, its very general terms, with regard to the waters of the deluge, covering "the whole earth under the whole heaven," must be understood of the earth as comprehending its oceans, as well as its continents and islands. Such terms would not have been correct if the beds of the oceans had been left bare and dry. If such had been the case, moreover, the ark, almost from the first, might have rested on dry ground ; and the dove sent out would not have been necessitated to return to the ark because she could find no rest for the soles of her feet." Probably after the evaporation required had taken place, the beds of the ocean were covered with the waters of the deluge to as great a depth as the earth was elsewhere. And in this case the marine fauna would neither perish in their own region, nor be drifted over the earth.

We have thus met the objection, both in its strongest

and in its weaker form, and we believe with the same success as that with which we have met all preceding ones,—converting the facts urged as objections into proofs, and deducing from them a minute and ever accumulating evidence for the unerring correctness of Scripture statement.

As far as can be deemed necessary, we have now surveyed the whole evidence furnished by the loess, and have candidly stated and honestly met all the objections which that evidence has been supposed to present to the diluvian origin of this, the most recent Pleistocene deposit. What, then, is the conclusion warranted? Does this deposit constitute a present evidence for the occurrence of the ancient Noaic flood of waters? Have we in it any portion of the *physical* proof which a geological observer ought to regard as valid? Does the evidence include all the wide harmonious results, and also all the seeming exceptions, which the precise language of the Bible, and the complicated action operating in the case, would justify us in expecting? Does the very extensive distribution of this fine inundation mud, the presence in it of a large number of perfect fresh-water shells, mostly of local species and recent-looking, and, on the contrary, the almost entire absence from it of marine remains,—does all this evidence point to a *series* of local inundations, or to the one grand inundation—the mighty flood of waters,—which, though largely local in its supplies and action, was also in the widest sense general; which

Moses tells us was, at the command of man's outraged Creator, made to cover the earth? Does not the evidence, and all its seeming exceptions, proclaim the biblical deluge? Indeed, are there any *exceptions*? Does not the entire phenomenon, even as geologists themselves have presented it before us, form the one varied and manifold evidence which alone could correspond with the complicated and often apparently conflicting effects which the deluge, as described in the book of Genesis, could not fail to produce?

It cannot, we think, be necessary to push these inquiries any further. To ask the string of preceding questions, in the light of the previous exhaustive discussion, is, we imagine, to answer them. As its one *grand cause*, we trace this diluvian mud and its fossil contents to the Noaic deluge. It forms a portion of that *physical* record which the action of its mighty waters would engrave upon the surface of the earth, and which all subsequent action has not been able to obliterate. As we survey its position on extensive plains, on the sides or flanks of valleys, on the sheltered slopes of hills, on sites which tower beyond any that would be reached by mere local floods, and at great distances from any present rivers; and when we look at its great thickness in deep valleys, and the mode in which it curves over irregularities of surface; still further, when we examine its homogeneous character as one immense mass of inundation mud, and gaze on its fresh-looking shells,—we can only think of one adequate

cause : the profound mud-charged waters of the deluge, which, after fulfilling their appalling judicial work of punishment, by destroying the antediluvian world, buried its remains under the mud which these waters had furiously taken up in suspension.

SECTION II.

THE BRICK-EARTHS.

These resemble, and mostly occupy the same relative position as, the loess.—Some brick-earths unfossiliferous.—These eliminated from the inquiry.—Produced by the same cause as the loess.—Testimonies to this.—Difficulty on natural theories of obtaining the large flow of water required.—The theories examined.—Temptation to dwell upon them.—The advantages of the diluvian solution.—Powerful water-action demanded.—Difficulties of the fluvial theory.—These met by the Noaic deluge.—The origin of the materials composing the brick-earths.—Remarks on the flint implements.—Belong to different epochs.—Length of the ante-diluvian period.—Animal remains of different ages accounted for.—Largely destroyed by multiplying man.—Extinctions of animals explained.—Sources of delusion.—Accuracy of Scripture.

WE have already suggested that a portion, at least, of our brick-earths, may be of the same age as the loess deposit, and may be largely owing to the operation of the same complicated cause. The main difference between the composition of the loess and that of the brick-earths is, that the latter contain a larger amount of argillaceous particles than does the former; having in them, in fact, clay sufficient to fit them for brickmaking purposes. They also occupy the same relative position as the loess, generally lying immediately beneath the surface soil, and overlying, where they exist, the Quaternary sands and gravels. And when found in such positions, there can be little doubt as to

their relative age; this being determined by the overlying soil and the underlying Quaternary gravels. They may also be assumed to be of the same age, when they are found to yield the same general assemblage of fossil remains. But should both these tests be absent from any superficial deposit used for brickmaking purposes, it then becomes difficult to determine its age. And this is the case over large areas of the chalk district in the counties of Bucks and Oxford. The reddish deposit resting upon the uneven surfaces of the chalk, and filling up the fissures, depressions, and erosions found in it, is, so far as our own experience goes, altogether unfossiliferous. It also differs much in its composition. Within short distances it presents marked changes. Sometimes it is a fine brick-earth, apparently free from flints; while a few yards away it forms an argillaceous flint gravel, which often contains large masses of flint, that exhibit neither fracture nor rolling.

Nor are such examples confined to the chalk district. We have seen similar deposits at great distances from that district; as, for instance, at some gravel-pits a little way from the road leading from Morton-in-the-Marsh to Toddtenham, which have yielded large masses of flint in the same unbroken and unrolled condition. Perhaps such deposits point to a glacial origin. The one which we have just named, near to Morton, must be some forty miles distant from the nearest point of the chalk hills, and how such masses of flint, often with

portions of chalk still adhering to them, could be transported to so great a distance by any other than ice agency of some kind, it is difficult to imagine. Nor is this all. In some parts, especially, of the large area over which we have examined them, these deposits strongly remind us of the "boulder clay." They present a similar unstratified mass of materials; only, instead of the "boulder," we have for the most part unrolled and unbroken masses of flint. Such deposits may be of various ages. They may be Glacial or Pre-glacial. Indeed, we see no possibility of deciding the question of age so long as our search in them for fossil remains proves unsuccessful. Up to the present time our own is *nil*. Where exposed, we have carefully searched these deposits from Beaconsfield to High-Wycombe; from High-Wycombe to Amersham; above West Wycombe toward Downly; and on the other side of West Wycombe, toward and beyond Lane End; and also for considerable distances along and back from the north-western escarpment of the chalk, on what are known as the Chiltern Hills,—but, with the exception of a few derived from the chalk, never succeeded in finding a single fossil. Applications to the brick-earth diggers, and to the men getting the gravel, have been alike unsuccessful.

Hence in proceeding to the consideration of the brick-earths, the only safe and satisfactory course to pursue will be to eliminate from the inquiry altogether all the deposits which present us with neither of the

above-mentioned tests of age. Nor can the advocates of man's great antiquity deem this course unfair; for so long as the deposits in question prove unfossiliferous, they can decide nothing either on the one side or the other. And at the same time we free the discussion from much irrelevant matter, and greatly simplify its purpose.

We shall therefore confine our inquiries to the undoubted brick-earths; in other words, to those argillaceous deposits that are used for brickmaking purposes, which either occupy a position between the surface soils and the underlying gravels, or which have yielded fossil remains of Quaternary age.

And now, as thus defined, what do these brick-earths testify? Do the evidences which their mineral constituents and fossil remains furnish point to some prolonged action, and to an enormous antiquity, or to a comparatively brief but stupendous action, and thus to a much more recent age? They have had, it is clear, the same origin as the loess, whatever that origin may have been. Occupying, as they do, the same relative position as that deposit, they cannot be consistently separated from it. The cause or causes that produced the loess must, though under modifying local conditions, have also produced the brick-earths. Could that cause be the biblical deluge? That it was produced by the action of immense volumes of water, we have the uniform testimony of geologists themselves. Thus, in a careful paper on the upper and lower gravels

of the valley of the Thames at Acton, Col. A. Lane Fox says: "The presence of large tracts of brick-earth, overlying the gravel, argues, as I venture to think, the existence of *large volumes of water at the time they were deposited*. Then to what cause are we to attribute the strips of the London clay laid bare on the sides of the valley, and of the tributary streams, at the average level of fifty feet. Obviously to denudation of some kind."

We shall not at present attempt to discuss the hypothesis by which the Colonel seeks to account for the various facts which the example which he has given embraces. At this stage we have only quoted his words for the sake of the testimony which they give to the presence of powerful water-action during the deposition of our brick-earths. The evidence of such action is so clear and conclusive that we are not aware that a single geological observer has questioned it. It is at once felt that nothing but immense bodies of water could have thrown down the large deposits of fine argillaceous silt, which constitute our brick-earths.

How these large volumes of water are obtained, and by what means they become charged with the requisite amount of fine argillaceous particles, we are seldom told. To conceive of immense volumes of water, derived from limited water-sheds, sweeping again and again through our present valleys; to conceive of these valleys, sometimes for twelve miles in breadth, and from one to two hundred feet in depth, cut

down by the action of these supposed volumes of water, since the first generations of men appeared on the earth ; and to conceive that a succession of floods would produce but one deposit, containing no intercalated beds of gravel,—*these*, and many similar suppositions are, of course, but trifling difficulties compared with the difficulty involved in the belief of the biblical deluge ! Any amount of *supposition* you please, if the facts are thought to require it ! Our brick-earths may bristle with any number of man's hypotheses, but with the biblical deluge?—no; never. The ground is pronounced sacred to *natural cause* ; and to that, and to that alone, it must at all hazard be attributed. What have the grave and profound *savants* of *science* to do with biblical solution ?

But we respectfully remind them that we claim a right to deal with their theories on the subject. As we read these theories, and read them as stated by their respective authors *themselves*, and try to master their elements, we cannot but feel that they are mainly based on suppositions ; and that drawn, as they often are, from a very few *exceptional facts*, the conclusions are most unsatisfactory, and can never command sober conviction. Thus, the finding of a single “ flint flake ” in the undisturbed lower brick-earths, at Crayford, and the fact that this deposit affords remains of some of the same species of animals that have been found in “ the Oreston Cave,” *along with a single example of Rhinoceros megarhinus*, are regarded as a

proof that this "Crayford brick-earth" may be of *Pliocene* age, and that *man* was probably *contemporary* with this extinct form of rhinoceros!

We are not surprised to find, that in the discussion which followed the reading of the paper in which these facts and conclusions were embraced, they were strongly demurred to by some of the speakers who took part in that discussion. And we have Mr. Prestwich's high authority for assuring our readers, that so far at least as Great Britain is concerned, all the deposits that have yielded remains of man are of *Pleistocene* age. But we have named this example to show how the appetite for man's extreme antiquity grows with some of its advocates, and on what slight and feeble grounds its claims to our acceptance are often urged.

We confess to a strong temptation to enlarge on this case. We should like to point out at greater length the elements of uncertainty which cleave to it, and which appear to be so strangely overlooked by the author of the paper in question. The assertions made in that paper would surprise us, if we did not recollect that to the eager partisan, anxious to reach the goal of a foregone conclusion, gulfs of difficulty are easily crossed. When, indeed, imagination is the steed, it is only a trifling matter to leap from the *Pleistocene* to the *Pliocene* age; or with a bridge of fancies to span even a much wider gulf of time than that which separates these two geological epochs.

Though himself a believer in man's great antiquity,

Mr. Prestwich demurred to the conclusions to which we have adverted. He justly urged that the mere absence of reindeer from the brick-earths at Crayford, and their presence in those of Erith and Grays, which might easily be accounted for by the barrier offered by the river itself, hardly seemed enough to mark any great distinction in time; and, we add, much less could this fact prove that the former were greatly more ancient than the latter. Looking, indeed, at the whole evidence in the case, we feel compelled to come to the conclusion, that all these brick-earths are of the same general age, and owe their origin to one mighty cause. If any one locality is to be regarded of different age from others because of the mere presence or absence of any particular animal remains in it, then we must divide the Quaternary deposits, not into two or three, but into a dozen or more divisions; and shall, as new discoveries are made, have to be endlessly modifying them, adding to or reducing their number. So long as the aggregate of our brick-earths yield only the same general Pleistocene fauna, they furnish no evidence to prove any greater antiquity for one than for another. The plant remains point to the same conclusion; the flora which they constituted "seems to have been much like that of the present day." Taking the flora, and the molluscan and mammalian divisions of the fauna as evidence, we see nothing to warrant a division in time, between any of our brick-earths as a whole. They form one system, and belong to one period.

Our only wonder is, that they have not yielded a larger number of older remains. Occupying a similar relative position to the loess, they were deposited by the same cause, and might be expected to have embodied in them remains of animals, which the flood, that threw them down, had washed out of the older strata over which they drifted. But few of such examples have been discovered as yet. And hence in determining these brick-earths to be of diluvian origin, and of late Pleistocene age, we have fewer exceptions to account for than might have been anticipated. Had they repeatedly yielded remains, not only of Pliocene, but of Miocene or Eocene animals, it would not have surprised us. Nor does the comparative absence of such remains from these brick-earths, throw any discredit on the diluvian solution of them. For that absence makes as much against their fluviatile, as against their diluvial origin. If local floods, equal to produce such "large tracts of brick-earth" occurred, they must, as surely as would one deluge, "lay bare" underlying deposits, and scoop out furrows in them. In this respect, neither solution has any advantage.

But no such balance of advantage exists between the solutions themselves. They are unequal throughout. As advocates of the diluvian solution, we *start* with an adequate cause; the opponents of that solution have their cause to create, or its existence to suppose! We have "the flood of waters,"—not only filling valleys, and covering plains—but "all the high hills under the

whole heaven," charged with inundation mud, and equal to deposit that mud wherever it is now found, and in all its varying depths. But where, in the contracted areas forming our British watersheds, is the fluvialist to obtain either one, or many such floods of water? And when he has obtained them, from what source is he to derive the argillaceous mud with which they must be charged in order to deposit these "large tracts of fine brick-earth." *Conditions must first be created.* We must have watersheds of thousands of miles in extent, rivers of thousands of miles in length,—must imagine some immense source of water supply, and then even banks of sufficient height to confine the waters within them,—and I know not how many other conditions, before the suppositions themselves can be at all consistent. But is all this likely,—is it rational to suppose it? Are such fancied creations legitimate data to start with? Must not theories built on such data, crumble beneath their own weight? With the conditions to *create*, with floods to *suppose*, and with an intractable agency to marshal for the accomplishment of a given task,—where are there any rational grounds of confidence? But we are told, that nothing but powerful water-action could produce the effects! We reply, Agreed. Nothing else could produce them; and therefore it is,—that as you have such waters to *suppose*, and they are already supplied to our hand, by the immediate interposition of the omnipotent Creator; that we boldly assert the unspeakable superiority of the diluvian

over all your fluviatile inundations. We both start with the same agency, with only this *trifling* difference,—that with us it actually exists, with you it does not exist, but has to be called into existence.

But as the *conditions* requisite for its existence are not found, we deny that they *did exist*, except in the scriptural form of a miraculous deluge. For to suppose a cause, where there was nothing to constitute a cause, would be to turn miracle-makers with a vengeance! The *conditions* were absent; then the *causes*, the supposed floods, were absent too. We cannot concede even the starting-point. The advocates of man's extreme antiquity must begin with suppositions only. They have *indisputable facts* to account for, they have only supposed *causes* wherewith to account for them. Such is the first triumph of the ignored Bible, over all the varied fluvial theories of its opponents.

But we go further. *Giving* them the cause, or causes, they assume; *giving* them the great and repeated floods which they are obliged to suppose,—they could not, in the form in which they are assumed, produce the effects which have to be attributed to them. No one flood, that was not equal in its volume and extent, and in its force and duration, to the Noaic deluge, could possibly throw down such large and extensive masses of fine argillaceous mud as form our brick-earths. Then if a *long succession* of floods must be supposed, as the only adequate cause, the difficulties become more numerous and formidable. How could a succession of floods be

made to deposit their muddy contents on the same spots, and to contribute them to the same beds? On the contrary, would not each flood of the supposed volume deposit its contents in the usual mode and order of gravel, sand, and mud? And would not each succeeding flood often *destroy*, and *always* modify, whatever had been deposited by its predecessor? A moment's thought must compel us to admit all this. But the *peculiar* phenomena afforded by our brick-earths present no such effects; they testify to no such action. Whatever may be their thickness, and whether they form brick-earths, or loess, or more or less siliceous deposits, they are for the most part composed of fine materials, "of inundation mud"; and therefore must have been thrown down during some *one* general action, by some *one* stupendous mud-charged deluge.

Hence, giving them the advantage of their supposed cause to start with, the theories of the fluvialists still break down, and leave most of the facts of the case unaccounted for. And such is the second triumph of the ignored Bible over all the theories of its opponents.

That the Noaic deluge would be *equal* to produce all the effects exhibited, and also to account for any seeming exceptions, we scarcely need stay to point out. It embraces the required volume of water, all the demanded powerful water-action, all the inundation mud for deposition, and a sufficiently long period of quiet for the diluvial waters to deposit that mud in all the localities where we now find it, and in all the degrees of

thickness which it presents. Any seeming exceptions to the general character and form of our brick-earth deposits, may well be referred to modifying causes which the deluge itself would embrace, to *denudation* and to *redeposition* during the final retiring of its waters; and to limited local floods and to elemental action which may have occurred since the deluge closed. We see not a single fact, we know not of a single difficulty, that cannot be thus accounted for.

But the fluvial theory has to encounter another difficulty. *Granting* it the floods demanded, and that those floods would produce the effects which our brick-earths exhibit, the question is,—Could a *series* of *local* floods produce the almost universally acknowledged *identity* which the brick-earths present? Would a *succession* of floods, of *local* origin, and of *local* action, repeat the same phenomena in a hundred different and often distant places? The person who can believe this must be prepared to embrace any theory, however monstrous and extravagant. But all this must be believed, if our brick-earths must be attributed to fluvial action alone! How could “that perfect similarity of these deposits,” said to exist, and which many believe “indicate for them a common origin,” result from the independent operation of a long succession of local causes? Surely, reason, the barest common-sense, must revolt from such a conclusion. And yet there is no alternative between such a conclusion, and the admission of *one general cause for the*

whole of these deposits. Admit this, which is in fact admitting the Noaic deluge, and the whole phenomena is accounted for. But deny it, and the phenomena defies solution; or the solution itself must consist of the most glaring improbabilities!

But the facts are just what would result from the one stupendous and all-comprehending biblical deluge. While everywhere *local*, it was also one all-spreading inundation, "prevailing upon the whole earth;" and, allowing for local modifying influences, would produce the one general deposit of loess and brick-earths which we now find so widely distributed. And such is the third triumph of the ignored Bible, over the theories which the advocates of man's extreme antiquity have arrayed against its testimony!

A few explanatory remarks shall close this section. And in the first place, we would remind the reader, that we by no means affirm that all the fine material forming the loess and brick-earths, was *originated* by the action of the Noaic deluge. We hazard no such assertion; nor need we. In the shape of fine pulverised matter, it may have long existed. Some portion of it may date back to distant geological epochs. Part of what is now loess or brick-earth, may have existed throughout all the antediluvian period, and have been on the face of the earth when, at the Divine command, it arose as dry land from beneath the waters of the Glacial seas. Abundance of such fine matter must have existed in all epochs, and there-

fore before the flood. The waters of the deluge would doubtless originate much inundation mud. But all that the case demands that we should credit it with is, the taking up of the stupendous amount needed, in *suspension*, and then, and especially during the 150 days of quiet, gradually depositing it in the same pure state and strikingly similar form which it everywhere presents. And to do this nothing but the Noaic deluge was equal. And with all this evidence before them, we are not surprised that the French geologists, as well as some in this country, should insist that these drift deposits are rather of diluvial than of fluvial origin.

We would offer another explanatory remark on the flint implements found, both in the brick-earths and the loess. And, first, we demur to their *form* and *degrees of finish* being made a test of age. As a fact, rough specimens and more perfect ones are found in the same beds. Then, unless we knew all the purposes for which these flint implements were made, we could not, from any difference in form, safely determine that there was any difference of age. Besides, the evidently rude tribes who manufactured these implements, might not have much intercourse with each other; and perhaps the only marvel is, that the implements present so general a resemblance to each other as they actually do. The general types are preserved, not only throughout Europe, but also in India and America. A fact which, amid all minor differences, unequivocally

points to identity of race. That tribes of men, sprung from many independent and widely distant sources, whether by direct creation or otherwise, would all be led to manufacture similar implements and weapons, is surely too much to ask us to believe, and involves too many sheer suppositions to be worthy of any credit.

Not that we contend for anything like absolute *identity* of age. Such identity we should earnestly deny. These implements may *represent six or eight thousand years of past time*. In some parts of the world, rude tribes of men manufacture similar implements still. The state of *art* amongst mankind is *not proof of age*, but of the degree of civilisation to which they have attained, or of the degree of barbarism to which they have sunk. *Rudely* manufactured implements belong to all *ages*; but *not* to all *states* of men. Those that have been found in the superficial deposits of the earth, may date from a *mid*, or even from an earlier, antediluvian epoch, up to the close of the *prehistoric* period. If there really exists between the implements themselves so great a difference as to constitute one set, "the drift type," generally found on or near to the surface, this type may probably represent the prehistoric period. And if so, this type might differ considerably from the forms used by the men who were destroyed by the flood. For between the period of the flood itself and the reoccupation of sites so distant from the generally supposed final resting-place of the ark, as are most of

those of Europe, many ages must have passed away. A thousand, and even two or more thousand years, may have expired, before the *postdiluvian* families again appeared on all the scenes that had been possessed by their antediluvian progenitors. Then there was not only this break, this considerable pause, in the *continuity of time*; there would also be a long and wide *break* in the continuity of human generation. Hence, between the persons who occupied the sites in the Thames valley *before* the Noaic deluge, and those who occupied the same sites *after* that deluge, there could only be a very distant relationship; and the difference between them might well amount to a difference of *race*, and consequently the persons of the two epochs might be expected to manufacture very different flint implements. Arriving, after the expiration of one or two thousand years, on the same scenes, where *antediluvian* tribes had lived and perished, *postdiluvian* tribes would most probably differ widely from such antediluvian ones; and would be likely to manufacture implements, differing as much from the antediluvian forms, as the "drift type" implements do from those which are supposed to be much older forms. In fine, the difference between the "drift type" implements and the supposed much older ones, is just that difference which the *facts* of the deluge would lead us to expect to find between the antediluvian and the postdiluvian forms; and thus the extreme antiquity which these flint implements are supposed to prove falls to

the ground. The actual evidence which the case presents can be solved without the aid of any of the manifold suppositions which that extreme antiquity involves.

Similar, though less extreme variations, might occur between antediluvian implements themselves. If, as it probably did, the antediluvian period lasted for two thousand, or two thousand five hundred years, the implements manufactured during the early and middle portion of that period, might reasonably be expected to differ, more or less, from those manufactured *near to its close*. And believing that all this might indisputably occur, we cannot but feel, that in these various forms of flint implements, we have that evidence for the Noaic deluge of which we are in search, and that the evidence strikingly corresponds with the effects which that deluge would produce.

Then the animal remains may embrace the same differences. As man began early to subdue the earth, and to replenish it, some of his contemporary animals might early disappear from some of the regions of the earth, and be replaced by others less inimical to man's own existence. During the two or three thousand years of the antediluvian period, the same region may have been successively occupied by different orders of Mammalia. The Carnivora may have been replaced by the Herbivora, and the larger forms of the Herbivora, by smaller ones. From the regions occupied by man the larger forms of Carnivora would, as a rule, disappear

the first. The sites they had occupied would be sure to be replenished, either by the multiplication of Herbivora already on the spot, or by intrusions from a distance. Thus a succession of seeming extinctions might occur in the same regions of the earth. Species of felis, ur-sus, hyæna, and of other Carnivorous animals, destroyed or driven back by the prevailing hand of man, would be most likely to be succeeded by species of elephant, rhinoceros, hippopotamus, horse, ox, sheep, deer, etc.; and, on the other hand, the horse, ox, sheep, deer, and the smaller Mammalia, both Carnivorous and Herbivorous, might be expected to survive the larger Herbivora. And from the above remarks it will follow, that in given regions some of man's contemporary animals may have become extinct long before the Noaic flood occurred; and although living on elsewhere, they may never have returned to the same regions. Such extinctions would become numerous, as mankind became multiplied on the earth; but they would be likely to occur, in some region or other, throughout the greater part of the antediluvian period. We are not surprised, therefore, to find the remains of many animals, *now* and *long since* extinct, which were once unquestionably contemporary with the human race. Nor are we surprised to find, that in such limited areas as Great Britain, for example, some of the animal forms became extinct long before they did on the continent of Europe, or in countries of much greater extent. All this is *natural result*, and is just

what the teaching of Holy Scripture would lead us to expect.

And if, as we believe, multiplying man was largely the instrumental means of destroying both the Carnivorous and the larger Herbivorous animals, then of course we do not wonder at the fact that some of the animal remains present clear evidence of having fallen by his hand. Were these and kindred facts *absent* from these deposits, the evidence which they yield for our biblical solution of them would be much less complete than it now is. Indeed, that it is so complete, and includes so large a portion of the *minutiae* of evidence, must astonish us, and challenge from us a conviction which is as intelligent as it is thorough. Nor is this all. Extinctions would not only occur in different regions, during the various stages of the antediluvian period, but *many* such extinctions would necessarily occur at the time of the deluge. According to the statements we find in Genesis, in every region occupied by man, not only man himself, but all the "cattle," including the horse, ox, sheep, "and beasts," wild animals, "fowls of the air, and creeping things," were utterly destroyed. And it is extremely improbable, that the different species of animals destroyed by the flood, would all reappear in the same regions, after the flood. Such a probability would have a thousand to one against it. In the Thames valley, or in the valley of the Somme, or in the Rhine valley, and in most given localities, many species of animals would perish at

the deluge, which would never occupy these regions after the deluge. Thus they might seem to be extinct in Britain, and not extinct in Italy, and *vice versâ*. And so in many other regions. And as man's remains are found in connection *with all these extinct forms, so, overlooking all the above considerations*, it would be natural to conclude, that man had been *contemporary* with a succession of *extinct animals*; and so his seeming antiquity be stretched out indefinitely beyond his real one. And *here*, we feel convinced lies the *grand fallacy* involved in all the theories in which man's extreme antiquity is asserted. The fact is, the authors of these theories have altogether failed to resolve the problem before them into its simple elements, and have left out of consideration a large portion of the data requisite for its full solution; and the inevitable result is a false number, an utter mis-calculation. Man was undoubtedly contemporary with animals which, in given regions, successively became extinct; but as such animals as those whose remains have been found would, under the circumstances given us in the Bible, necessarily become extinct, these facts supply no proof of greater antiquity for man than that which the Scriptures teach; but, on the contrary, they are proofs of the marvellous accuracy of the biblical historian, and are in striking accordance with the date which that historian has assigned as the period of man's creation. No greater antiquity is needed; and for any greater antiquity, no clear proof is afforded. *When it is forthcoming, we shall candidly examine it.*

SECTION III.

"THE HIGHER AND LOWER LEVEL GRAVELS."

Of diluvial origin.—Found in all countries.—Found at considerable distances from present rivers.—Are similar in all places, and must have had a common origin.—Other theories fail to account for this.—A long succession of floods must have left many terraces of gravel.—Theories of valley erosion tested.—The requisite floods impossible to obtain except by miracle.—The salient points of the theories which teach man's extreme antiquity considered.—They contain a vast amount of disputable matter.—Negative evidence in the case unsafe and delusive.—Threefold grouping of Pleistocene animal remains not tenable.—Man figures in all the groups.—Glacial and Preglacial remains with Pleistocene ones accounted for.—A few Preglacial animals might live on into the human period.—The mode of this. As yet all the animal remains found along with man's are Post-glacial.—Many marine animals have lived on into the human period.—No absolute reason therefore for the destruction of land animals.—If theories respecting the erosion of our river valleys were true, man's antiquity must be enormous.—Examples taken from the Thames valley.—Different theories of erosion.—Difficulties stated by Col. A. Lane Fox.—These difficulties yet unexplained.—Facts and theories opposed to each other.—Succession of theories.—The effects correspond with the diluvian solution.—In this solution nothing has to be supposed.—Its simplicity and completeness.

THE deposits thus named present the same evidence of diluvial action as do the brick-earths and loess beds already considered. They often occupy the same sites, and have evidently been thrown down by the opera-

tion of the same forces. In their mineral composition, and in their fossil contents, they may differ from each other, even on contiguous sites ; but they nevertheless bear the same general character, and have an obvious relationship to each other. In some cases, as in the neighbourhood of Acton, for example, human implements may be found in the higher level gravels, and yet seem to be absent from the lower terraces of the same material, while they reappear in the deposits forming the bed of the river itself. The animal remains which these deposits have yielded, present similar differences. Not only in localities distant from each other, but at spots within a limited area, different gravel pits have yielded varying lists of fossils.

These deposits of gravel are present in all countries, and are generally found occupying the same relative position. Overlain—except when they come up to and form the surface—with the surface soil, the loess and the brick-earths, they are found resting upon the underlying formation, of whatever age that formation may chance to be. It may be the boulder clay, the London clay, the chalk, the oolites, or still older rocks. These gravel deposits occupy the brows of hills, are found flanking the sides of river and other valleys, cover large spaces in the bottoms of valleys, and are spread over extensive areas that are now at great distances from any present river-action.

We need not again name the examples given in the work on the “Biblical Antiquity of Man.” The mam-

malian remains found in a field near Shipston-on-Stour, and also in a brickyard near the same town; the bones and teeth of the *Bos primogenius*, obtained from a gravel pit between Warwick and Wellsbourn; and the premolar tooth of *Rhinoceros tichorhinus*, found in gravel twelve feet beneath the surface, near Stow-on-the-Wold,—were all at a considerable distance from any present river-action, and could never have been deposited by any local river flood. Mr. Flower, F.G.S., gives another example, near Croydon, of a deposit of gravel, capped with loess, some twelve miles distant from the Thames, “containing remains of elephant, and exactly resembling the Thames valley gravels, and communicating with them.” Many similar deposits are found much higher up the Thames valley, in the neighbourhood of Benson, and stretching away in patches on the hills beyond Ewelme, toward Britwell and Britewell; and although as yet we have failed to discover flint implements in these several spots, yet the gravels so closely resemble the gravels that have yielded the implements, that there is every reason to believe that they are of the same age. In fact, but few localities lack them altogether; and as these deposits everywhere occupy the same relative position, present the same general character, and appear to be so perfectly similar to each other, they must, as Mr. Flower justly urges, have had the same common origin. Deposits scattered through the British Isles, found in every country in

Europe, in India, and other parts of Asia, in North and Middle America, and at least in North Africa, occupying the same relative position, presenting the same general aspect, and yielding similar human implements, cannot otherwise be accounted for. Nothing but one general cause, operating throughout this wide area, could possibly produce a phenomena so uniform and wide-spread.

Theories which ignore the common origin of these so-called drift deposits, and which refer them to the operation of local forces, acting through hundreds of thousands of years, whether under similar or differing conditions, utterly fail to account for these facts, and leave the problem which they form unsolved. That *any* forces, acting during a succession of distant periods of time, and in many widely distant localities, would, at *all* these periods and in *all* these localities, produce a similar phenomena, and throw down similar beds of gravel, yielding similar human implements, is to conceive of what could not possibly occur, except from a succession of stupendous miracles ! Operations of nature are here out of the question. Natural law is immeasurably unequal to the task. A succession of local floods, for example, occurring at different periods, whether every year, or every hundred years, even if there were any proof of their actual or possible existence, would necessarily *repeat* the whole class of the phenomena. That is, each succeeding inundation would leave its deposits of gravel and of sand and mud. Nor

can this objection to the fluvial theory be evaded, by supposing that each succeeding inundation removed the deposits which had been left by its predecessor, *replacing* them always with its own. This would by no means meet the case which these deposits present, unless each succeeding flood added its share to the *same bed* in the series, which would be impossible. If, indeed, as is contended for by the advocates of man's extreme antiquity, our river valleys have been eroded to their present depth by the action of a long succession of immense floods sweeping through them; and that the beds of gravel, occupying different levels on their banks, or away from them, have been thrown down during the lapse of thousands upon thousands of years,—there would not have been only two or three, *but a long series of higher and lower level* gravel terraces. Between a *long succession* of stupendous floods, scooping out valleys to the depth of some one or two hundred feet, and deposits on only a threefold level, there is surely a rather startling discrepancy. Not again to urge the grave difficulties involved in supposing the existence of such immense bodies of water, and the impossibility of deriving them from the drainage of a limited area; such floods, if granted, would not, and could not, without the interposition of a miracle, produce the deposits which are attributed to them.

Unless, in fact, the supposed deepening process proceeded by *leaps*, advancing by several feet at

a time, which is, of course, denied, and the contrary earnestly asserted, the extensive and destructive floods which are imagined in the case would drift out into the ocean itself all loose materials, like those in question, instead of leaving them where they are now found, on the brows of hills and along the flanks of valleys. We defy any person to conceive a succession of floods, however obedient such floods might be to his will, that would repeat the phenomena presented by the gravels that have yielded us Pleistocene remains. If the *Reservoir* above the town of Sheffield were once more to pour its waters along the old course, would it *just add a little additional thickness to each bed*, of coarse and fine material, that it had left before? Would not all the previous deposit be largely swept away, or its materials be mingled with the debris of the second disaster?

We again beg to remind the reader, that powerful water-action is the general solution employed in every theory held on the subject. But *how* to obtain that water-action on so *vast a scale* as is necessary, and *how* to obtain it in so many different and distant localities, and *how* to make it everywhere produce similar results, and to throw down similar deposits,—is what no theorist has ever yet told us, and we are persuaded never will tell us. This is the grave problem which the advocates of man's enormous antiquity *must solve* before they have a *right to ask* us to receive their theories, and to disbelieve the accuracy of the Jewish

historian ; and until this problem is solved on plain natural principles, we shall fearlessly utter the good old Scottish verdict of "*Not proven.*"

And yet, with all these serious difficulties unmet, and with all these grave problems unsolved, we are confidently told, that the fossil remains of man and of his contemporary animals, found in these Pleistocene or Quaternary deposits, *belong to three distinct groups !* And, of course, it is inferred and concluded, that periods of time of enormous length elapsed between the existence of each group in the series.

It is only a few of the more salient points of such theories that we need stay to consider. One remarkable fact about them is, that they all contain a vast amount of disputable matter. In the first place, the data on which these theories are based are not admitted by many of our geologists. This will be seen from the discussion which followed the reading of a lengthy and elaborate paper on the subject, by B. Dawkins, Esq., before the Geological Society of London, and printed in the Society's Quarterly Journal, vol. xxviii., page 445. To bring forward and urge such disputed data, may provide matter for speculation ; but to make them the foundation of theories involving conclusions that are at direct variance with Scripture statement, is surely a course of procedure altogether unjustifiable. For what are the grounds for this threefold grouping ? Clearly the chief grounds urged are, the difference between the animal remains,

which different deposits have yielded *up to the present time*. But are these grounds *sufficient* to sustain conclusions so momentous? In the discussion referred to, Mr. Prestwich justly and conclusively urges that they are *not* sufficient. The Pleistocene Mammalia of Great Britain, at any rate, do not warrant any such threefold grouping. Nor do the *undoubted* Pleistocene remains of any country warrant it.

Then it must be remembered that this threefold grouping is largely built on mere negative evidence: an evidence which has been repeatedly proved to be utterly unsafe to build upon. Thus the fact, that the remains of a given animal have not *yet* been found in any deposit, is not, considering how imperfect and incomplete all *search* must necessarily be, any proof of the non-existence of its remains in that deposit; much less is it a proof of the non-existence of the animal itself at the period when the deposit in question was thrown down. A large amount of such negative evidence has already been proved to be most delusive and misleading. The mere fact that a given deposit of gravel has yielded a fauna differing in some few of its species from the fauna yielded by some other deposit of gravel, whether the two deposits are near or distant, does not form any clear proof that the two deposits are of widely different ages. So many other circumstances, beside the lapse of time, may have contributed to produce this state of things, that to attribute it to time alone is a most illogical and

questionable mode of reasoning ; and hence any conclusion built on such reasoning can only deserve utter rejection. To warrant, in short, the conclusion sought to be built upon it, it must be clearly shown that nothing but a succession of fauna appearing on the same site could produce the facts adduced : an impossible task.

Then, so far as the theory under review is concerned, there is one fact which deserves further remark ; and that is, that in all the lists of the so-called three respective groups, the *genus homo* (man) is embraced. He figures in all the three differing lists of animals that are given by Mr. Dawkins. Now, this at once compels us to eliminate a portion of the author's premises. The Newer Pliocene of Sir C. Lyell embraces what are called the Forest and Mammalian beds of Norfolk and Suffolk, which are overlaid by the boulder clay, or by a deposit of Glacial age. Now, Mr. Evans, one of the highest authorities on the subject, tells us that, up to the present time, all the beds which, in Great Britain, have yielded the remains of man, are *Post-glacial*. And long ago we were assured by that competent authority, Dr. Falconer, that none of the *Mammalia* contemporary with man dated from before the *close* of the Glacial epoch. These are all important facts and admissions, and sweep away most of the data on which Mr. Dawkins relies for his so-called early Pleistocene group of animals. They are not, as a group, Pleisto-

cene at all, but mostly Pre-glacial ; and he obtains this group, by ignoring all real distinction between Pre-glacial and truly Pleistocene epoch.

Not that we should be surprised to find a few Pre-glacial forms mingled in deposits yielding Pleistocene ones ; nor would such a discovery create us any difficulty. The fact is, we should expect to find some such older remains in deposits that had yielded those of man and of his contemporary animals. In considering the effects which the waters of the flood would produce, we suggested the strong probability that, in denuding the surfaces of older deposits, remains of animals contained in them would be washed out, and would be mingled with its own debris, and would thus seem to belong to the same epoch as were the animals destroyed by the flood itself, or as contemporary with those that had become extinct during the antediluvian period. The presence of a few Pre-glacial forms of animals in Pleistocene strata would thus be amply accounted for, and consequently would never warrant us to conclude that such deposits were really of Pre-glacial age, or that man himself had existed in the Pre-glacial period. Such assumptions are most unwarranted, and have scarcely a *shadow* of evidence to support them ; for the above and kindred considerations would enable us sufficiently to account for any seeming exceptions to the facts stated by Mr. Evans and Dr. Falconer.

And this conclusion would exclude a great proportion

of the animals forming Mr. Dawkins' so-called "*Early Pleistocene Mammalia*." The relationship, in fact, sustained by any part of this group to the human period is more than questionable. And yet *we* have no need to deny it; we can afford to let it pass. For even granting that a few species of *Mammalia*, belonging to Pliocene or to Pre-glacial epochs, lived on into the human period; and that, as a proof of this, their remains had been found along with those of man himself and of his contemporary animals,—this would not, as appears ever to be assumed, furnish any proof that *man's appearance* on the earth must be coeval with their own, and that because they existed during the Glacial period, therefore man did. In such reasoning all logical consistency is wanting. The *later* portion of the existence of any species of animal might synchronise with man's; while the species itself might have preceded man by many ages. Though found on the earth together at a certain period, it does not follow surely that they had always been contemporary. An infant is found living in the same house with its great grandfather, but no sane man would believe that this fact warranted him to conclude that the infant and its grandfather were of the same age! And yet the reasoning in the two cases would be strikingly analogous.

And in making the above concession to the advocates of man's great antiquity, we remind the reader that we by no means wish it to be understood that we

endorse the facts of such supposed contemporary existence. We can account for the existence of older remains in deposits of Pleistocene age without any such supposition.

Not that we deem this solution to be absolutely necessary in the case. In our view of the present or human period it can be dispensed with. We can just conceive it to be *possible* that a few hardy species of Mammalia might live on from the later Pliocene into Pleistocene times. The period of intense cold, called the Glacial epoch, admitted in some way or other by all geologists, which preceded the human period, and during which the rough deposit, called the boulder clay, was thrown down, if general and prolonged, as it appears to have been, would unquestionably produce that state of general desolation and depopulation which the expressions used in the second verse of the Book of Genesis are supposed to describe; but when those expressions are compared with *parallel texts*, we shall perhaps see reason to admit that the language of the second verse of Genesis does not require us to believe that the destruction of the land fauna was so complete and absolute as to include every individual of every species. It is just conceivable, at all events, that a few of the Mammalia might survive all the hostile influences of the long Glacial epoch, and live on into the human economy. That the greater part would perish is morally certain. The intense cold, the prevalence of glaciers, of extensive sheets and masses of ice, to-

gether with the submergence of the land, could not fail to exterminate most species of land animals. And yet a few might escape. At any rate we have no need to affirm that they did not.

It is a well-known fact that many marine animals did escape ; and, therefore, *a priori*, why not land animals ? The destruction of the one was not *demanded* any more than the destruction of the other. Hence the difference found between the two sets of animals is *not* to be resolved into any *special purpose*, but into the simple fact, that the one set could exist in water, and that the other could not. Sheltered by profound ocean depths, shell animals would survive any amount and any length of intense cold ; but the land fauna would necessarily largely perish. And the facts strikingly agree with the conclusion thus suggested by the nature of the case. Many of the shells found fossil in the Pliocene and Eocene strata, are also found existing in our present seas and rivers. Some two or three species seem to have lived on from the chalk formation. The number of recent forms also found fossil gradually increases from the Lower Eocene up to the close of the Glacial epoch.

Hence, there could be no *absolute reason* why all animals should perish before the introduction of the human epoch. As a *fact*, all marine animals did not perish ; hence there could be no *essential reason* why all land animals should. So far as an *abstract necessity* is concerned, the two cases are parallel. The

difference is one of *circumstances*. Ice and cold would naturally destroy the land fauna; they would *not* necessarily destroy the marine fauna. Many species of shell animals, and especially *individuals*, would perish, but numbers would be sure to survive, and be found existing in the new economy. But this could only rarely occur with regard to land animals. Still, such cases are possible. Species of rhinoceros, of elephant, of deer, and of a few of the Carnivora, might possibly live on into the human period; and the remains of the animals which thus survived the Glacial epoch, might, as they gradually became extinct, become mingled with those of man; his implements and skeletons being found in gravels and caves that have also yielded such *extinct* forms. But to infer from this that the *commencement* of man's existence dates as far back as the *commencement* of the existence of these extinct forms, or that man was contemporary with them in the Pre-glacial period, is *altogether to beg* the question of man's great antiquity. We again repeat it, that man's own remains, and the remains of the animals really contemporary with him, have only as yet been found in Post-glacial deposits. And to assert, on grounds of mere supposition, and in defiance of all the opposing evidence which the case presents, that man existed *before* the Glacial period, and also during its long periods of cold, seems no better than the *wanton* assumption of a position hostile to the literal teaching of the Bible.

We are well aware that recent theories, respecting

the formation of our valleys, and especially of our river valleys, and the mode in which the deposits of gravel which they contain were thrown down, *demand* for man an antiquity which nothing but hundreds of thousands, nay *which nothing* but *millions* of years can measure; but then we do not and cannot admit these theories. The *mere suppositions* which have to be made in each and all of these theories are so numerous and are so utterly unlikely to be realised, that the theories must inevitably break down beneath them.

Take the Thames valley for an example. This valley is supposed to have been *eroded* by subaërial action, or by the action of the river in its present form, or to have been cut down by successive floods from the level occupied by its highest fossiliferous deposits, down to the present bed of the river. But I fear that this argument, like most illogical ones, will prove too much, even for the advocates of "man's extreme antiquity." From a multitude of carefully collected and well stated facts, Col. A. Lane Fox proves "that the river Thames must have flowed in the same meandering course that it does now for two thousand years, and in all probability for a much longer period, the *bed* of the river having *actually risen* during this period, as appears by the depth at which these ancient relics [piles associated with flint cells and human skulls] are found beneath the sedimentary deposit." Now if for a period of more than two thousand years the bed of the Thames has rather been rising than been farther deepened by

erosion, then what countless ages, what a succession of inconceivably prolonged epochs must it have required bodily to scoop out the valley of the Thames to a depth of some two hundred feet ! Let any spectator take his stand on some height overlooking a portion of the Thames valley, and sweep his eye over the area embraced *within* the two hundred feet level, or the area that lies *below* that level in the district through which the Thames flows, and he will, I imagine, conclude that no amount and no number of floods, much less subaërial or ordinary river-action, could cut down or erode a valley of such depth and dimensions. Unless blindly committed to such a theory, he must at once pronounce it impossible. So far as subaërial and *ordinary* river-action go, Mr. Prestwich *does* pronounce it impossible. But his own theory of a succession of great and extensive river floods is quite as unsatisfactory, and involves extensive suppositions of another kind. His theory assumes the existence of immense floods, and also a prolonged succession of such floods in limited areas, where, on natural principles, they could not occur ; and he also assumes that a succession of local floods would produce one generally uniform phenomena, which is also impossible on natural principles. In fact, when thoughtfully looked at, such theories become monstrous absurdities ; and hence, we are not surprised to learn from Col. A. Lane Fox "that they appear to have been abandoned by some of their best authorities."

This careful observer has well and clearly stated the *problem* presented by these gravel deposits as they occur in the Thames valley in the neighbourhood of Acton. His words are: "The presence of these implements in the high terrace, their absence, as far as our researches go, in the mid-terrace, and their reappearance again in the present bed of the Thames; the abundance of animal remains in the mid-terrace, and their great rarity, if not absence, in the high terrace; and the *invariable* occurrence of both implements and animal remains in the *lowest strata* of the gravel immediately adjoining the London clay,—are *facts* which demand an explanation of some kind."

The Colonel thus evidently feels that no theory yet devised *has* explained them. The problem which he so lucidly states, but does not attempt to solve, he is clearly convinced yet remains unsolved. And any one who duly considers the facts must arrive at the same conclusion. Such facts *square* with no explanation that has yet been given to them. Then the explanations themselves are often inconsistent. Thus, in all the theories which suppose that the present broad valley of the Thames has been eroded down to its present depth by subaërial or ordinary river-action, or by river floods, the upper level gravels are regarded as of far greater antiquity than the lower ones; and yet in the example given to us by Col. A. Lane Fox, the animal remains found in the *mid-terrace gravel*, according to the age assigned them by geologists, are immensely

older than are the animal remains that were found in the high terrace beds. Facts and theories are thus not only *inconsistent*, but they glaringly contradict each other. So in the case of the *lowest terrace*, supposed in all these theories to be much the newest in the whole series, both man's flint implements and the animal remains invariably occur. Such *apparently* inconsistent and contradictory facts do, indeed, demand an explanation of some kind. The various theories of erosion leave them unexplained. Demanding, as they all do, the lapse of enormous periods of time between the formation of each so-called terrace, they are utterly inconsistent with the facts which the respective terraces have yielded; for so far as the highest and lowest terraces are concerned, the remains of both point to the same epoch. Then, the so-called mid-terrace is still more perplexing. The absence, so far as research has gone, of flint implements, and the presence of abundance of animal remains, create a problem most difficult for our geologists to solve.

And hence theory succeeds and modifies theory, each in its turn to prove a failure, and to be consigned to the limbo of abortives. The conclusion from all this is inevitable, that the right key of solution has not yet been discovered. Fossiliferous *gravels*, as well as brick-earths and sands, exist in our valleys, and on our plains, at different heights above the respective river-beds; but *how* they came there, by what means they were deposited where they now are,

is what we have never been satisfactorily told. The facts demand explanation, but the demand has never been met. It is assumed that they prove an extreme antiquity of the human race; but the problem of that antiquity has yet to be solved.

True, these gravel deposits furnish evidence of some sort of stupendous water-action; but to *what sort of water-action* does that evidence testify? We have seen that it does *not* correspond with the effects which would be produced by *any* succession of local floods. Does it then correspond with the effects,—the simple but still complicated effects,—which we have shown would be produced by the manifold action of the Noaic deluge? To ask this question in the light of the facts and reasonings already placed before the reader, is largely to answer it. Starting with the deposits formed during the antediluvian period, and with the general physical features of the globe as now existing,—the breaking up of the fountains of the great deep, the forty days and forty nights of torrential rain, the continuance of the mud-charged diluvial waters at the same height over the earth for 150 days, and then the gradual returning of the waters to their destined lake or ocean beds, would, we venture to assert, produce the entire of the phenomena which these gravel deposits and their fossil contents present. The fourfold force which the scriptural account of the deluge so impressively places before us, would, wherever it was exerted, produce one

vast, extended, and, on the whole, *uniform* phenomena; such phenomena, in short, as are presented to us by the so-called Quaternary deposits of our river valleys. If between the effects which would be produced, and the evidence that has been found, there is discrepancy,—where is it?

And let it be remembered, that in this biblical solution we have nothing to suppose. We already have all the *forces* which the theorist has to suppose, or to command into existence, and on a scale which no theorist has yet ventured to suggest. The immense floods, the large volumes of water, their wide and powerful action, their denuding and redepositing effect, the filling up of old channels, and the production of new ones, or reopening of the old; the throwing down of similar deposits on many different heights of level, and other kindred phenomena, which every advocate of man's extreme antiquity is obliged to take for granted,—are the very forces and effects which the biblical deluge embraces. For a closer correspondence between *ancient* effect and *present* evidence, we could not ask. The two meet at every great point, and in most of their minutiae they also largely harmonise.

We need not stay to point out to the reader the advantage of such a solution. It has, not only simplicity, but also completeness, to recommend it. It embraces the stupendous and manifold agency, and the varied action, which alone could produce similar phenomena in localities so numerous and distant.

What other agency could thus repeat its effects in a thousand different places? The only one that is in accordance with Scripture teaching,—this solution affords far the best explanation of geological fact. It is not only an equal, it is an *incomparable* solution. It not only rests on a pre-eminent sacredness, but also on a pre-eminent completeness.

We must now proceed to test it and its opposing theories by a few examples. Most of our examples hitherto have been taken from the Thames valley. It may be advisable now to shift the scene, and to select a few additional ones from other localities.

EXAMPLES TESTED.

Paper by J. Evans, Esq., F.G.S., F.S.A., on Discoveries at Fisherton.

—These discoveries described.—Mr. Evans' explanation of the facts.—His theory questioned.—Its many doubtful elements.—“The united broad stream: how obtained in this area.”—Difficulties of his theory of excavation stated.—The upper level gravels must have been swept away.—Their existence on the sea cliffs.—A grave difficulty.—On the theory of erosion.—The river system of India.—Elevation denied in the case.—*Similarity* of the Quaternary gravels—cannot be accounted for by any local action.—Intended examples omitted.—The Noaic deluge supplies the appropriate, the generally uniform, and the adequate cause, which the phenomena demands.—The diluvian solution meets and covers all the facts presented by the Pleistocene deposits.—Can such a solution be a false one?

WE will take as our first example—“Some recent discoveries of flint implements, Mammalian bones, and

land and fresh-water shells, at Fisherton, near Salisbury," given in a paper by John Evans, Esq., F.G.S., F.S.A., and printed in vol. xx. of the *Quarterly Journal* of the Geological Society. Mr. Evans says: "What, however, invests these Fisherton beds with peculiar interest, is their similarity to those at Menchecourt, near Abbeville, in which flint implements have been found; a similarity pointed out by Mr. Prestwich in his account of the discoveries made in the valley of the Somme."—"It was not, however, in these beds of brick-earth, or loess [in which some previous discoveries had been made], that such a discovery was destined to be first made, but in certain beds of gravel at a still *higher level*, in which up to the present time no organic remains have been found."—"The [flint] implements [found] are all of oval form, more sharply curved at one end than at the other, and equally convex at both sides. They are all considerably stained and discoloured, and two of them are much rolled. In form they present the *closest* analogy to many of those from the valley of the Somme, and from Ticklingham. I have some specimens from the latter place, which, in point of colour and character of surface, exactly correspond with those from Fisherton."

"The pit from which is dug the gravel in which these implements were found, is about a mile to the west of Salisbury, nearly opposite Bemerton New Church. The deposit lies upon the southern side of the *spur of chalk dividing the valley of the Wiley, or*

Nadder, from that of the Avon, about a mile and a quarter above the confluence of the two rivers, which are about a mile apart. Its thickness is about ten or twelve feet. Though less distinctly stratified than the gravels of Moulin Quignon, there is a strong general resemblance to them." This chalk spur probably attains a height of 100 feet above the river, and the deposit of gravel is about 20 feet lower. Between these upper gravels and the bottom of the valley there are beds of gravel and brick-earth, which, in the various pits opened in them, have yielded the remains of some 21 species of Mammalia, 15 species of land-shells, and 16 species of fresh-water shells.

In the same paper Mr. Evans describes several other fossiliferous deposits of gravel, at Hill Head, near Tichfield, and Brunage, between Chilling and Hook, where the cliff on which the gravel rests is some 35 feet above high-water mark. The gravel consists almost entirely of subangular chalk flints, among which are some of considerable size, and some quite fresh and unrolled. It also contains some large blocks of Tertiary sandstone. "There are a few quartz and chert pebbles in the gravel; and there are also a few sandy seams with false bedding intercalated in it, as well as some *loess-like* and marly seams."

"We were unable to discover any traces of shells or bones in the gravel, nor had it in any way the appearance of being a raised beach. On the contrary, it had many of the characteristics of being a fluvatile

gravel. [?] The area covered by these drift-beds appears to be very extensive. Mr. Prestwich informs me that they also extend along the coast to Southampton, and are moreover found on the other side of the Southampton Water. Taking all these into the account, there can be but little [?] doubt that these gravel beds are merely an extension of the valley gravels of the rivers, Test, Ilchen, Hamble, and other streams, *which, at the time they were deposited, flowed at this spot in one united broad stream, at an elevation of some forty feet above the existing level of their outfall, over a country which has since, by erosive action, been in part converted into the Southampton Water.*" About all this, even taking everything into the account, there cannot only be a little, but much, *very much* doubt. The *inferences* from the facts stated, are all *assumptions*. No *proofs* are offered, either for the possibility or actual existence of this united broad stream, for the asserted erosion of this extensive area, nor for the possibility of mere fluvial action throwing down these widely dispersed deposits of gravel. If so, *where* and *what* are the proofs? We feel compelled to say, that, for the conclusions asserted, we are unable to extract a shadow of argument from the paper before us. The positions are taken for granted. And on *assumed* grounds it is asserted, that "such an alteration in the relative positions of land and water may seem to claim for the flint implements contained in the gravel an almost fabulous antiquity; but it must be remembered

that at Reculvers we have a perfectly parallel instance of fluviatile [?] beds containing implements, fashioned by the hand of man, capping cliffs abutting on the sea, at a height of fifty feet above it. We shall presently see, that at Fisherton" (the description of which we have already quoted from Mr. Evans' paper) "the evidence of extreme antiquity is equally strong."

But we altogether question the major member of the argument: we more than doubt the premises. We will, however, hear the conclusion of the whole matter. From the presence of the remains of two or three species of animals which are now natives of northern latitudes, the eggs of the wild goose and wild duck, and of large blocks of sandstone and masses of flint, which have been transported from a considerable distance,—from the presence of these in the deposit which he describes, Mr. Evans thinks that the evidence "tells much in favour of the theory advanced by Mr. Prestwich, that the greater excavating powers of the rivers of the Post-pliocene period, as compared with those of their representatives of the present day, were mainly due to a more rigorous winter, *probably* accompanied by a more abundant rainfall and a greater tendency to floods."

This, however, is only doubtful and feeble testimony after all; and in the next paragraph, Mr. Evans almost withdraws it. "Still we have ample testimony that the climate of that period was such as to permit of abundant animal life, and that the rainfall was not so

excessive, but that there was a sufficient supply of vegetable food. The denuding and excavating power of the rivers *cannot*, therefore, have been out of all proportion to what they are at the present day, and the effect produced in the course of a single year, or *even a century*, can hardly have been appreciable in valleys such as those through which the rivers now run." And if a *century* of floods could do but little, even supposing their existence, then of course a million centuries could not excavate these valleys down to a depth of 100 or more feet. Hence Mr. Evans seems almost to be appalled at the sight of the conclusion to which his premises drive him. "When, therefore, we look at a section like this at Fisherton, with its high-level and low-level gravels, or at that of the valley of the Somme, at Abbeville, in which these beds have their exact parallels in those of Moulin Quignon and Menchecourt, and when we find that in the high-level gravels, which must [?] have formed the bed of the river when it ran [?] at an elevation of 80 or 100 feet above its present level, are contained flint implements worked by the hand of man; when we find that a time long subsequent [?], when the river had excavated [?] the greater portion of its present valley, the mammoth and woolly rhinoceros, or, as at Fisherton, the cave-lion and hyæna, the lemming and marmot, were still denizens of the country, we are almost staggered at the inevitable conclusions which must be drawn as to the period that has elapsed

since the implements, such as those before us, were fashioned."

Such are the *facts* which these southern deposits of gravel supply, *and such is the fluvial solution of them*. Let us carefully examine this solution. In the first place, its *doubtful elements* are enormous. The facts, of course, are indisputable. But each step of advance toward "the inevitable conclusions" rests on assumptions, and what ought to be *proved* is taken for granted. That there are deposits of gravel 100 feet above the present rivers, containing man's flint implements, and that there are other deposits of brick-earth and gravel at a much lower level, yielding mammalian remains, with remains of birds, land and fresh-water shells, *we feel quite sure; but we by no means feel sure*, that since the upper level gravels were deposited, the extensive area, in this district, included within the 100 feet of line height, has been excavated by mere river-action. We may, somehow or other, be marvellously obtuse in our apprehension of these matters; but we confess our utter inability to divest ourselves of the feeling, that the erosion supposed in the case is all assumption.

In the first place, what proof have we of the floods themselves? Even in regard to the existence of the *colder* climate, much has to be assumed,—and assumed to be afterwards largely given up again. As they *both* both visit this country and breed in it, and especially the latter, the mere presence of the remains of the wild

goose and wild duck in these deposits can afford no proof that they were thrown down during a season of intense cold. Then although the lemming and the marmot are *now* confined to colder climates, this, of itself, is no decisive proof that they could not have lived in such a climate as that at present possessed by Great Britain. Again, the presence in some of these deposits, of large blocks of sandstone and of masses of unrolled flints, can hardly *alone* prove ice-action as the transporting agent. It will thus be seen, that the existence of a more rigorous climate, on which this supply of floods is largely made to depend, is itself a most doubtful element in the calculation. And were we to *grant* its existence, the author of the paper before us, as we have already seen, contrives to reduce its effects to a minimum, *scarcely appreciable in a hundred years!* According to Mr. Evans' own showing, in fact, the climate could not have been much more severe than it is at present, and consequently the supposed floods could not have been of much larger volume than are the floods which flow through these river valleys during our own winters. Thus, the floods themselves are as doubtful as is the existence of the intense cold that must be supposed to supply them.

But supposing that we could grant the author, both the more rigorous climate, and the periodical floods,—and floods of much larger volume than Mr. Evans seems willing to allow,—yet still the next step from this

to the excavation of the extensive area specified, by such floods, embraces a still larger amount of *doubtful* element. No proof of this vast amount of excavation is attempted to be offered us. This matter of erosion is entirely assumed. Then the admissions made by the author are surely fatal to the theory of excavation by river-action. If no perceptible progress is made in a hundred years, or as Col. A. Lane Fox has proved, with regard to the Thames valley, in *more* than two thousand years, then where in the world do our fluvianists get their proof for the excavation of our river valleys by river-action alone?

That, *on the principles of those who contend for man's extreme antiquity*, some such theory of excavation is necessary, we at once admit. They cannot otherwise account for the fact of these fossiliferous Pleistocene deposits being found on different heights of level. For example, they can only explain the position of the high-level gravels by supposing that the excavating force, when these high-level gravels were deposited, stood at and exerted itself at this level. Then, of course, they have further to suppose that the work of excavation slowly advanced during thousands of years, until, under some *unexplained circumstances*, the mid-level brick-earths and gravels were thrown down. Then thirdly, they have to assume that the same extremely slow process of excavation went on until our river valleys were eroded to their present depth. This is the theory.

But how it bristles with difficulties! Why, to begin with, are there only two or three terraces of these deposits? Would not the supposed excavating force leave a deposit at *every few inches of height*? By what means could a slowly excavating power avoid doing this? Would it not as necessarily produce a terrace at *all heights*, as at three heights of level? If not, then what other conceivable force could so control this excavating power, as to compel it to leave its mark on only three different terraces? *On the theory of gradual erosion* these are insuperable difficulties, and involve a series of facts which defy explanation. Had the theory been true, we must inevitably have had a series of small terraces, from the most elevated deposit down to the present river-beds. The utter absence of such a series of terraces most conclusively disproves the theory.

Nor is this all: as we have already urged, a long succession of floods would many times over repeat the same phenomena. In connection with *each flood* there must be a deposit of gravel, of sand, and of fine silt. Now, as it is not pretended that we have more than *three series* of such deposits at the utmost, the theory of erosion by the action of floods again utterly breaks down, and we have another list of facts which, on that theory, defy all explanation!

Then, further, could an area so extensive as the one these river systems embrace, be excavated to its present depth *since* the upper level gravels were thrown

down, and yet leave these same gravels still spread over a large portion of that area? The supposition involves a simple impossibility. At any rate, nothing could prevent the *general erosion* of the area in question but the presence of very *compact* and *firmly cemented* deposits; and it is not, and cannot be, pretended that our upper or high level gravels are such. On the contrary, for the most part these deposits are composed of loose materials, and would readily yield to erosive action.

Still further, we cannot but regard the fact that these deposits of gravel are found *capping the cliffs* along miles of coast on both sides of the Southampton Water, as utterly inconsistent with a fluvial origin, as well as with any theory of river erosion. It is extremely difficult, if not impossible, to conceive *how* any mere river-action could deposit beds of loess and gravel along a great length of seacoast,—even allowing that, since their deposition, the sea had cut back its cliff to a considerable distance. This is, indeed, only to shift the difficulty. The question is, How could fluvatile deposits be lodged in such positions at all? We know the reply is, that they then formed *the bed* of the supposed united broad stream that had its outfall near this spot. But where is the proof, of this? Some theory of elevation, of a raised beach, would be more plausible; but of this Mr. Evans assures us there is no proof; that on the contrary they present every evidence of being a fluvatile (?) deposit. Hence, to

account for them on the principles of the advocates of man's extreme antiquity, he must suppose *that the whole area beneath the level of them*, and also of much more elevated deposits, has been excavated by river-action. But how the supposed broad stream *spared* so large a portion of its old bed, and only excavated a few river valleys and depressions in it, is what we cannot understand. No large river would have left these deposits on sea cliffs; and if it could have left them there, it would, in excavating the valleys by its own subsequent action, have surely swept them away. Then there is another difficulty besetting the theory. This supposed great river is made to perform a *twofold* service. It deposits the loess and gravels, and then is made to erode them, and to excavate valleys far beneath them. What are the *circumstances* under which the supposed river is made to perform offices, not only so different, but so *opposite*? We know that when the *fall* of a river is considerable, it excavates; we also know that where its fall is comparatively little, it *deposits*; but we never knew a river do both at the same point of its course.

Look at the river-system of India, so well described by Mr. Ferguson. Along all the more level portions of their course they *deposit*, raising their beds until those beds are considerably above the level of the surrounding country, when, during some flood, they burst their banks, and find for themselves a new channel, and which they again raise like the one they

have left ; until, having thus shifted their beds over the whole area, they raise that area considerably above its original level. This is natural action. But a *contrary* action is asserted in the case under consideration.

There is only one mode in which the supposed excavation could occur. *Elevate the whole region some hundreds of feet*, giving to the river a large amount of fall to its very mouth, and it would doubtless excavate all the lower as well as the upper region of its course, though it might not leave large portions of its old bed to testify to the excavation. But this elevation is the very thing of which Mr. Evans says there is no proof. We fear, therefore, that we must give up this twofold office of the supposed united broad river as a hopeless difficulty.

Were we not afraid of exhausting the reader's patience before we had exhausted our list of objections, we might start many others against this fluvial theory. We will content ourselves with urging one more. Mr. Evans, as well as Mr. Prestwich, and other writers on the subject, are impressed with *the great similarity of these Quaternary gravel deposits*, as well as with *the great similarity of their fossil contents*. Whether in the valley of the Thames, or of the Avon near Salisbury, or around and beyond the Southampton Waters, or of the Great Ouse above and below Bedford, or of the Little Ouse at Thetford, near Brandon, and Lakenheath; or in the valley of the Somme, and near Menchecourt or of Germany, of India, and America,—these deposits

and their fossil contents possess the same general character, and occupy the same relative position. Now could a *series* of local and independent floods, confined to their river valleys, possibly produce this result? Could an effect generally so uniform, and we will add so singular, have had so manifold an origin? If *similarity of result*, on a scale so extended and manifold, does not point to a oneness of origin, then proof of anything is out of the question, and becomes an impossibility. But mere fluviate action, however powerful it may be supposed to be, could never supply *the one* originating cause, and therefore we feel ourselves compelled both to doubt and to deny the fluviate theory of solution.

We had marked some other points in the paper under notice for observation, but space forbids us to enlarge. Nor can it be necessary. The objections we have urged are sufficient to discredit all the theories of subaërial or of mere river action that have been abetted: and with this we content ourselves. For the authors of these theories we feel all due respect, and honestly admire their industry in collecting, and their ability and accuracy in discussing facts, but as the theories devised to account for the facts are such as involve the denial of what we cannot but deem *express Scripture statement*, fidelity to our convictions and to Scripture truth compels us, not only to *differ* from the authors, but also to show that the theories are indefensible, and utterly break down beneath the

weight of objections that can be legitimately urged against them.

We had also intended to test other examples, and the evidence which they supply of powerful water-action, by these fluvial theories of erosion; but we forbear. They are all so similar in their general character and fossil contents, that in stating the facts, and in testing the theories of fluvial erosion by them, there must unavoidably have been much of repetition, both of fact and of objection and argument, that we shrink from the task, and decide to spare both our time, and the reader's purse and patience. Did we know of any deposit that *seemed* more favourable to the theories of the advocates of man's great antiquity, we should feel bound to notice it; but we sincerely declare that we do not know of any such example, though we have kept our attention most carefully fixed on all that has been published on these Pleistocene deposits, and have taken every opportunity of examining them for ourselves. Hence, before dismissing this branch of the subject, we have only to test the evidence which these Fisherton and coast deposits of Quaternary gravels supply, by the diluvian solution which the sacred Scriptures afford us.

Will the manifold and perfectly unique action of the Noaic deluge enable us to solve the problem formed by the interesting *facts* so carefully collected, and so clearly stated in the paper of J. Evans, Esq., F.G.S., F.S.A. ? To show this is now our task. Is it insuperable ? It

may look formidable, but will, we think, yield to patient analysis.

What the case demands is, an *appropriate*, a *generally uniform*, and an *adequate cause*. Does the Noaic deluge supply such a cause? In other words, is it, in each of these senses, equal to produce the effects to which the evidence testifies? These are the points which we have to illustrate and prove.

The first point, our opponents themselves being judges, is indisputable. The *cause* to which we refer the facts is *appropriate*, for it is *the cause* which all more or less assume, or take for granted, in the case. At any rate, the sub-aërialists, or those who attribute all this supposed erosion to ordinary elemental action, are but few, and we may safely leave them to be dealt with by the advocates of powerful fluvial action. With the latter, so far as the cause itself is concerned, we agree. They attribute these deposits and the subsequent erosion to immense floods, to the action of large bodies of water. Mr. Prestwich tells us that he cannot conceive of any other cause, however prolonged in its action, that would produce the effects to be accounted for. Powerful and extended water-action is felt to be indispensable. But agreeing, up to this point, with most of the advocates of man's extreme antiquity, we are here obliged to part company with them, and in doing so we free ourselves and our solution of many of the formidable difficulties by which all their theories are beset.

Their first formidable difficulty is, *how* to bring the cause on to the scene of action. We agree with them as to the simple cause, but as to the *mode* in which this cause is brought to play its stupendous part, we altogether differ from them. They have to *assume* it, to *create conditions* for it, and to attempt its proof on doubtful data. We are assured of its actual presence on the scene by an infallible Divine authority. They must *imagine* it, where, on any natural principles, it is most difficult to conceive of its existence; we have it brought on to the scene by an Omnipotent hand. We both start with the same cause,—and which, with both, is thus deemed to be *appropriate* in the case; but one with a cause which has to be taken for granted, on a large amount of questionable data,—the other with a cause which has the *testimony* of *Holy Scripture*, *national tradition*, and *monumental evidence*, to vouch for its existence! The *mode* in which the advocates of man's extreme antiquity bring these immense bodies of water to deposit these beds of gravel, and to erode our river valleys, has to sustain a weight of suppositions which must ultimately utterly discredit it; but the mode by which we believe they were brought on to the scene is clearly and positively asserted in the book of eternal truth! They have *all* to suppose; we have *nothing* to suppose. *We have* the asserted cause to begin with; we commence with clear Divine testimony; they must begin by assuming what they cannot possibly prove, that limited watersheds would repeatedly

supply large floods of water! We thus get the *appropriate cause*, *minus* all its formidable difficulties. Our opponents may demand, Whence do you get this "deluge of waters"? We reply, from "the Power of God." And with this Source we are satisfied. "*He* who holds the waters as in the hollow of His hand," could with infinite ease pour them out upon the earth!

But does the Noaic deluge meet the *second demand*, — a *generally uniform cause*? Phenomena presenting characters so similar, in localities so numerous and distant, must have had a common origin. Does the Noaic deluge *form* that common origin? Does it supply the *one cause* to which every example can be reasonably attributed? That all opposing theories altogether fail to do this we have already seen. That a succession of floods, occurring independently in many distant and dissimilar localities, would produce anything like a uniform phenomena in each and all such localities, it is impossible to conceive. And as such uniformity is not only admitted, but *asserted*, by the advocates of man's almost fabulous antiquity, then we urge that they must either consent to occupy an entirely untenable position, or give up this theory of local floods and of local deposit and erosion. They cannot consistently hold the two. The *great similarity* of the phenomena, or the *local* character of the cause, must be given up. The two cannot stand side by side. To suppose that a cause *acting* locally and independently, and through long periods of time,

would produce an effect *everywhere similar*, is surely a supposition the extravagance of which could scarcely be surpassed by anything in the dreams of "The Arabian Nights" or in "Gulliver's Travels."

Hence the question recurs, Have we the demanded *generally uniform cause* in the Noaic deluge? Would this produce effects which would be everywhere similar in their character? Would it deposit beds of gravel, of sand, and of brick-earth, throughout the whole area which it occupied, in the same relative position, of the same general character, and yielding the same general fossil contents? Who can reasonably doubt it? The *one* stupendous deluge, accomplishing everywhere its work of destruction, of denudation, and deposition, would unquestionably produce that *similarity* which our Quaternary deposits of loess and gravel present. The action, though manifold and complicated, was *one—everywhere one*. It was one "flood of waters." At the same time, differences of physical configuration, in the mineral composition of the materials previously existing, and in the fauna and flora of each separate locality, would abundantly account for any differences which, in these respects, our widely distributed Quaternary deposits may embrace. Such local differences would occasion all the modifications of the one general type which these deposits of gravel may have furnished. In short, we have in this case the local combining with the general, and the general combining with the local, to produce a phenomena unique in its character, while stupendous

in its extent, and which could not be effected by either if acting independently and alone. The supply of material would be largely *local*, the physical features of each *site* would be more or less *local*, and the flora and fauna would be in some degree *local*; "the fountains of the great deep" would to some extent be *local*, and the torrents of rain would everywhere be *local*; and yet the flood itself, the one deluge would be also absolutely general, to the extent to which it "prevailed upon the earth." The Noaic deluge thus meets the demand for one *generally uniform* cause which the deposits in question present; and meets that demand in a way unspeakably more satisfactory than can any other theory whatever. It fully accounts for the great *similarity* of the deposits that have yielded human remains, and yet at the same time it will fully account for any real or seeming local exception to that similarity.

Hence, we may now proceed to the *third point*. We have the *appropriate*, the *fitting*, cause, and we have the *generally uniform cause*. Have we also the *adequate cause*? Is the one *appropriate*, and the one *generally uniform*, cause which we already have, equal to all the effects which have to be accounted for? In asking and in answering this question, we have not only to look at the *examples* presented by Mr. Evans, by Col. A. Lane Fox, and others that have been referred to, but to the entire phenomena, as it presents itself, wherever it has yielded remains of man, and of man's

contemporary animals. Bearing in mind the entire action of the Noaic deluge, the separate and combined operation of its *four several forces*, and the *time* which that deluge occupied,—would it produce the phenomena which has to be accounted for? Would it effect a vast amount of erosion, and largely denude all loose superficial strata? Would its mighty, and often conflicting waters, be sufficient to drift large blocks of sandstone and unrolled masses of flint for considerable distances? To throw down beds, both of rolled and unrolled gravels, and to deposit them, not only in valleys and depressions, but on the flanks of valleys, on plains of considerable height, on “spurs” near the confluence of rivers, along or near to sea coasts, and, in short, wherever such deposits of gravel have been found? Would the rising, tumultuous waters of the flood, be able to bury in or beneath its own debris the flint implements and other remains of antediluvian man and of antediluvian animals, not only on one “level,” but all the levels, whether high-level, or mid-level, or low-level? Could it everywhere produce a general and yet a local deposit? Could it wash out remains of animals from older deposits, and blend them with the remains of animals of a later epoch? Could it mix Pliocene with Pleistocene fossils? Would *its action*, at the successive stages of its solemn progress, very much modify and complicate its own results,—presenting at length a group of facts as perfectly unique as the one stupendous cause to

which we attribute them? Could it be a *transporting cause*, bringing foreign materials and foreign organic remains on to areas which did not naturally supply them,—and yet could it be *so far a local cause*, that the deposits thrown down by it should largely consist of local materials and of the remains of the local fauna? Could it, *by converting* the materials on which it rested, and which it drifted along, into “a *plastic state*,” allow of the coarser gravels, and flint implements, and larger bones of animals, to sink down to the base of deposits of sand or gravel, to be arrested by the firmer deposits beneath? As they rose over the whole earth, or as “they returned from off the earth,” would the waters of the deluge leave “stripes in the London clay,” plough out furrows, and fill them up again with partially transported materials,—would they occasionally intercalate beds of sand (sometimes showing false bedding) and loess between beds of gravel? Would all the fountains of the great deep, and the stupendous flood produced by forty days and forty nights of incessant torrential rain, be equal to take up and hold in suspension an almost inconceivable amount of silt, of fine pulverised materials,—or, in other words, be equal to *charge themselves with mud*? Would mud-charged waters, prevailing over all the earth, and covering its highest mountains, be able, during 150 days of quiet, to spread out over all the earth a vast sheet, and in valleys a profound covering, of inundation mud? And as those waters

retired from off the earth, could they largely and variously *denude* the earth of this mud, this loess, which they had previously thrown down? Would the deluge drift a large amount of materials into the beds of rivers, and apparently obliterate them, by spreading over their own debris, and the contiguous land surface, a bed of brick-earth or loess; and thus perfectly concealing from view such ancient river-beds, until some chance railway cutting reveals the secret, and brings the hidden fact to light? In short, would a great and general flood of waters bring together into one deposit the remains of animals of Pliocene age,—of animals which in many localities had, by means of man's destructive hand, become extinct during the antediluvian period, and of both animals and man who had perished by the deluge itself,—blending these remains of different epochs in every sort of order? Would it not in some localities, and even in some *whole countries*, utterly destroy *species* of animals and whole *classes* of animals, which would never appear in these localities and countries again? and which, therefore, in these localities and countries, *would have been extinct*, not only through all the historic, but also during all the prehistoric period? Then, in such river valleys as the Thames, the Avon at Salisbury, the Great and Little Ouse, and the Somme and others in France,—would such a deluge be found sufficient, taking in the whole stage of its *rise* and *recession*, to throw down a *high-level* deposit, containing only or

mainly *man's flint implements*; a *mid-level* deposit, yielding mostly the *remains of extinct*, as well as of still existing, species of animals; and a third, or low-level terrace, invariably yielding both the flint implements and the animal remains?

In the preceding list of questions we are not aware that we have overlooked a *single feature* in the whole series of Pleistocene deposits that requires to be accounted for. They cover, we sincerely believe, the whole ground embraced by the discussion respecting the antiquity of the human race. We cannot recollect, or we should name it, another fact or difficulty that does not come under one or other of some of the above questions. We do not shrink from the most minute and rigid application of the test of adequacy; persuaded, not only that the Noaic deluge *will* meet the whole case, but, also that no other supposed cause will meet it. Are there, then, any of the above questions that cannot be answered in the affirmative? Must we hesitate to say *yes*, to any number of them? In addition to an *appropriate* and *generally uniform cause*, does not Noah's flood supply a *cause* altogether equal to produce effects corresponding to, and covering the *whole evidence* presented by, these Quaternary deposits. In it we have the *fitting*, the *one uniform*, and the *adequate cause* demanded, *minus all the suppositions, difficulties, and extreme antiquities, beneath which all other solutions* labour, and which, we believe, are fatal to them. There is not a *single deposit*, whether of

loess, or sand, or brick-earth, or gravel, that lies beyond the scope of the deluge. - There is not a form of erosion, or denudation, or of redeposition, yet discovered in connection with these Pleistocene beds, that the deluge, as described in the book of Genesis, is not fitted to produce. There is no mixture, or *seeming* mixture, of extinct with living forms of animals, that could not be occasioned by its manifold action. The *loess*, the inundation mud, is not found covering a single spot where the *still* waters of the mud-charged deluge would not deposit it. We know not of a solitary terrace of gravel, whether coarse or fine, whether intercalated with beds of sand or not, whether on a higher or lower level, and whether containing the remains of man and of animals, one or both, or not,—that could not be thrown down, or receive its present constituents and character, from the action of the deluge. It embraces *all, and unspeakably more* than all, that has ever been supposed to have operated in the case, *unclogged* by a host of insuperable difficulties, and untrammelled with an antiquity which its advocates deem fabulous, and by which they themselves are staggered!

Can this solution, then, be a false one? Could probable effect and actual present evidence so minutely and comprehensively agree, if the one did not stand to the other in the relation of cause and effect? In all these Pleistocene and Prehistoric deposits, with their remains of man and of extinct or still living species of

animals, we have a *portion of the records* of the antediluvian period, and of its sudden solemn close by a miraculous deluge of waters. During his two thousand or it may be *three thousand* years, antediluvian man, as he spread from the central point of his creation over the whole earth, and became degraded, it may be mentally and physically as well as morally, as his dispersion widened and his enormous wickedness increased,—would manufacture countless numbers of flint or stone implements; and which, therefore, he would, on all the sites of his existence, *leave out of all proportion to his own remains*. Thus whole deposits of gravel might contain no remains of man but his implements. This, in fact, under the circumstances of the case, was inevitable. From other deposits man's implements, so far as present search has gone, might seem to be absent, while at the same time they might yield a considerable number of animal remains. Other deposits, as those at Acton, called by Col. Fox the low terrace gravels, might invariably yield both remains of man and animals. These facts, unexplained, according to the Colonel, by any hypothesis or theory yet devised, find their entire solution in the manifold action of the "flood of waters" by which God destroyed the old world of sinners. Our valleys teem with the records of a drowned world. Without even poetic fiction, our fossiliferous Quaternary deposits tell a tale of terrible overthrow, of a solemn majestic catastrophe, "that destroyed man and cattle, the beasts of the earth, and

the creeping things," and which left a desolated earth and a perished race of ungodly men. We walk over the monuments of death, and explore a solemn graveyard; and, in our attempts to decipher these monuments, might, by forging theories inimical to Scripture truth, well tremble to repeat the very unbelief in which the extreme wickedness which brought down destruction on the old world had its origin.

We may now close this branch of the subject. It has, we think, been sufficiently shown, that the *evidence* supplied by these upper and lower level gravels, as well as that supplied by the loess and brick-earth, is not only in accordance with the solution which the Noaic deluge affords us, but that it is in accordance with that solution alone.

SECTION IV.

THE EVIDENCE FURNISHED BY FOSSILIFEROUS CAVES AND FISSURES.

Caves and fissures described.—Their contents.—How filled up.—Humboldt's opinion on the subject.—Examples named.—The Victoria Cave, Settle.—Its history given.—Its various fossiliferous contents.—No local inundation could occur to fill up this cave.—Its various deposits accounted for by the biblical deluge.—Kent's Hole and Oreston caves.—Show how animals of different epochs might be associated together in the same caves.—This a very possible source of error.—The interesting facts supplied by these caves.—The Victoria tested by the diluvian solution.—This cave represents four stages or epochs.—The serious reader will demand proof, not suppositions.

CAVES and fissures, many of which are fossiliferous, are found in all limestone districts. A fourfold agency seems to have aided in their formation. Some, originally, appear to have been simple rents or fissures, produced by upheaval and dislocation of the strata. Surface waters, charged with vegetable acids, percolating the rock, and dissolving out the lime, have also greatly aided in forming these limestone caverns. Other caves have evidently been the channels and beds of underground streams, and have been eroded and smoothed by their action. While the presence of water-worn gravel and of marine shells clearly proves that, not only the caves along our present coasts, but

also high up the face of ancient sea cliffs, were largely formed by the action of waves. But we need not speculate on their mode of formation, nor stay to determine the period of its occurrence. They probably belong to all epochs, and some of them may date from points long *anterior* to man's appearance on the earth, and contain fossil remains of animals which were extinct even in Pliocene or still earlier times. Their mineral contents are various, sometimes embracing both local and transported materials. Often they are largely filled with reddish clay, formed by the decomposition of the rock, and with pieces of limestone that have fallen from the sides and roof of the caves. Piles of such fallen masses of limestone frequently block up the caves, and render it difficult to detect and explore the various passages and chambers into which the caverns often branch. The *mouths* are often concealed by what are called "breccias"—coarse materials that have either fallen from the cliffs above, or been heaped up by floods and waves, and cemented into one hard mass by the lime dissolved out of the limestone in which the cave is situated.

When first discovered or broken into, they not unfrequently seem like a place of enchantment, a fairy palace, pillared and domed by brilliant crystals, and floored by various coloured marbles. From the roof hang large and beautiful stalactites, sparkling like gigantic diamonds; and upon and ascending from the floor, a stony forest, fantastic forms of crystallised

water, rise, strange and awing as the temples of the ancient mythologies.

In some of the caves, as, for example, in the one at Oreston, the stalagmite floor is found on more than one level. The caves themselves are of immense capacity, extending for miles into and under mountains, and penetrating to profound depths. In some cases rivers and streams disappear in them, flowing for great distances in some subterranean channel, to reappear with gushing force and fury far away from the point of entrance. Other caves and fissures are comparatively dry, and are only moistened by the water which percolates through the superincumbent rock.

As already remarked, they sometimes contain both local and transported materials. The clay and masses of limestone derived from the parent rock, are found mixed with gravels and sands and mud that have been drifted into them by the action of water. In some of the fossiliferous caves especially, *water* has clearly played a very important part.

The great Humboldt, indeed, regarded water as the principal agent in filling up our fossiliferous caves. And although since his day many additional caves have been discovered and explored, yet nothing has been found in them that requires any essential modification of his opinion. He says, "When a phenomena is general, and repeated under the same conditions, as has been the case in the filling up of the horizontal

and vertical fissures of calcareous rocks, such a phenomena must have been produced by a cause as general as the effects which group around it. According to this double condition, which is presented in all the cases where remains of animals of geological date are found, it is impossible to attribute it to *any other* cause than to violent inundations."

In this explanation of the contents found in our fossiliferous caves, Humboldt would not exclude the fact that in some of them, at least, a portion of these contents had, in the modes above described, been derived from the rocks in which the caves are situate. The two facts, indeed, are quite consistent with each other, and may indisputably stand side by side.

But this will the best be seen in actual examples. Let us take one of the latest discovered, and one of the most carefully examined, of our British caves, the Victoria Cave, at Settle, in Yorkshire. We are told that "this cave is situated about half-way up a line of grey limestone cliffs, overlooking the grey limestone pavements and broken precipices which extend northward to Ingleborough, and consists of large chambers filled nearly to the roof with accumulations of earth, clay, and stones. The committee began their work by cutting a trench from the outside of one of the entrances, through a layer two feet thick of angular fragments of stone broken away from the cliff above by the action of frost, which

rested on a dark stratum, composed of fragments of bones, more or less burnt, burnt stones which had formed a fire-place, very many fragments of pottery, and a few Roman coins."

The writer from whom we quote the above, inclines to the opinion that these remains point to the beginning of the seventh century of the Christian era. He proceeds: "But there were evidences of a much older occupation of the cave than this Roman one. At the entrance, below the Roman Celtic layer, there was a talus of angular stones six feet thick, which rests on a layer of *soft clay*. At this level the committee discovered a few rude bone awls, and a bone fishspear or harpoon, along with chipped pieces of flint, and broken bones of ox and bear, which proved that man, in a rude state of civilisation, inhabited the cave before the accumulation of the talus." The writer supposes that these remains may date back some five thousand years. He then proceeds to remark that "the grey clay on which these more ancient remains of man rested, offered a serious obstacle to further examination, since it was more than twenty-five feet in thickness within the cave, and contained no remains of man or of animals. Fortunately, however, the enterprising gentlemen who form the committee, have lately sunk a shaft, and have obtained evidence of a still older occupation of the cave, not by man, but by hyænas. The broken bones, coprolites, and teeth of these animals,

show that in ancient times they lived there in considerable numbers; and the gnawed bones and teeth of the mammoth, bison, reindeer, red deer, the great woolly rhinoceros, and the cave bear, belong to the creatures which formed their prey. The time when these animals were living in Yorkshire is that which geologists know as the Pleistocene or Quaternary, and corresponds with that during which Kent's Hole and Kirkdale caves were filled up with similar remains. The shaft at present has been sunk to a depth of thirty feet from the original surface; and the accumulation of earth and bones extends to an unknown depth below."

In its main features, this description would suit all our fossiliferous caves. They vary, of course, and sometimes considerably, in their minutiae. Their different *positions* as to height above the present surface, and the configuration of the surrounding country, would naturally lead us to expect some variety, both with regard to their contents, and also as to the mode in which those contents had been deposited in them. In many cases, as in the present one, the caves would be largely filled with materials obtained from the surrounding or from contiguous deposits. In other cases, however, the water-action, to which they are attributed, might drift into them a considerable amount of materials which that water had transported from a distance. The sand and clay, so generally found in these fossiliferous caves,

either as mixed with stones and masses of fallen rock, or as forming, as in the Settle cave, separate beds of considerable thickness, are doubtless largely owing to the action of water. Then these latter accumulations must have been rapidly formed. For as masses or pieces of rock fall from the roofs of caves, or from the faces of the cliffs above them, more or less every year,—had not these accumulations of sand and clay been rapidly formed, they must have contained such pieces of stone in considerable numbers. *Their* absence, therefore, as well as the absence of human and animal remains in the twenty-three feet of stiff grey clay found in exploring the Settle cave, is a conclusive proof that this non-fossiliferous bed was rapidly deposited. It follows that its great thickness affords no proof of great age.

Then if, as appears to be implied in the account from which we quote, the materials through which the new shaft was sunk, consisted of an accumulation of earth and broken bones, its accumulation might have been equally rapid with that of the aforesaid stiff clay. For had its accumulation been slow, the earth and broken bones would have been more or less mixed with masses or pieces of fallen rock; and as this is not stated to be the case, the evidence gathered, is altogether in favour of a rapid deposition. Hence, however profound the “unknown depths below,” not examined, may be, they form no proof of great age, nor of any very pro-

longed occupation of the cave by the hyænas. This example, indeed, is clearly one of the "*vertical fissures*" of Humboldt, and may truly reach down to an unknown depth. Like the similar fissures in the Rock of Gibraltar, it may penetrate the limestone mass to a great depth; and the broken bones and earth may have been largely swept into it by "violent inundation."

We are not aware *what explanation*, if any, has been given of the accumulation of clay and earth to so great a depth in this cave or fissure, but it is clearly largely of aqueous origin. Any other agency than that of water must have left very different results, and have produced a deposit largely composed of angular stones. Some "violent inundation," some mighty deluge of waters, charged with siliceous and argillaceous particles, must have flowed into the cave, and, in the form of clay and earth, have deposited these particles, along with the animal remains found in the entrance or around it, and in the inner parts of the cave, mixing them in what, from the description given, seems to be an unstratified mass.

But how *such an inundation* could occur in this district, and especially of sufficient extent and violence to reach the height of this cave, it is, on natural principles, impossible to conceive. To obtain any local flood sufficient for the purpose, many violent suppositions must be made, and many condi-

tions, of the existence of which we have not the shadow of a proof, must be imagined or taken for granted. To *account* for the facts stated by the gentlemen who have explored them,—not only with regard to this Settle cave, but also with regard to all others containing the remains of man, and of man's contemporary animals,—not only one, but many very general and violent inundations must be supposed to have occurred. But, except *the facts* themselves, there is no proof of either the possibility or of the actual occurrence of such floods. The case is one of supposition only. The *facts*, it is felt, demand the presence of powerful water-action; and therefore its presence is taken for granted. The often complicated and apparently inconsistent phenomena which our cave-deposits present, cannot, it is perceived, be accounted for by any other cause. This cause alone is thought to be sufficient. As we have pointed out in the work on the "Biblical Antiquity of Man," nothing but powerful water-action is regarded as offering an explanation of the *facts* which our patient and accurate explorers have brought to light from the Wookey-hole cavern, near Wells, the Brixham cave, the fissure in Weardale, the Belgian caves, the Languedoc caves, in the bone caves of Montpellier, the caves or fissures in the Rock of Gibraltar, Malta, and elsewhere. Though so widely distributed, all these examples are felt to present the same general phenomena, and a similar

collocation of facts; and must, therefore, as Humboldt urges, have had the same common origin.

And yet, on natural principles, on the operation of what is deemed mere natural law,—whence, in districts *like this elevated one at Settle*, are they to be obtained? “Violent inundations,” of sufficient volume to flood materials into a cave half way up the side of a cliff, cannot exist without conditions adequate to supply them. A watershed of immense extent, torrents of rain, and a sudden melting of enormous masses of ice and snow, must occur; but where, in the district in question, is there any proof of them, or of any conditions resembling them? This Settle cave, according to Mr. Tideman, is situated some 1300 feet above the level of the sea; and is nearly as high as any one point of ground in the whole of the district! Whence could any inundation be derived of sufficient violence to drift sand and mud into its chambers? The only alternative is submergence; but of this there is no proof. And if there were, *where* and *how* in the meantime were the hyænas and their prey to exist? The fact is, *on natural principles*, such floods *as are supposed* never did and never could occur in this district since it received anything like its present physical features.

I need not remind the reader, that in the Noaic deluge we have the “violent inundation,”—the immense and rushing flood of waters,—which, according

to Humboldt, these cave cases demand for their solution. And we have *this cause* without having to *suppose* it! We have not to *invoke* it into existence amid impossible conditions! *We accept its actual occurrence* as a Divinely stated fact; and yet a fact attested by all national tradition and monument. And with such a Divinely provided solution, the difficulties arising from the *height* of many of the caves above the present country around them would all vanish. *Heights and situations* which no local floods, produced by the operation of natural causes, could possibly reach, would, one after another, be surmounted and covered by the "prevailing waters of the flood." At the same time, an immense amount of fine material would be carried into the caves, forming, by deposition, beds of clay or of earth, and either fossiliferous or non-fossiliferous, according to circumstances. As appears to have been the case in the Wookey-hole cavern, near Wells, such floods of water would not only *convey* materials into the caves, but would also largely *re-assort* the materials which they previously contained—forcing this blended mass up to the very roof. Local deposits, the situation of the caves, their form and structure, and the direction of their openings, would all tend to modify the general results,—blending individual features with great similarity.

We do not, of course, attribute the filling up of these fossiliferous caves to the action of the Noaic

deluge alone. We know not *their positive age*. Probably some of them are *Pre-glacial*. We, in fact, do not see any reason for confining them to the human epoch. The same causes that are producing them now would be in operation in all the limestone districts of previous epochs. It follows that they may have been in existence in Eocene, Miocene, and Pliocene ages; and may, therefore, contain the remains of animals 'which existed during these past epochs. And further—as they may have existed as caves during several epochs, so they may, on different floors, or chambers, contain the remains of animals belonging to several epochs. In other words, Miocene or Pliocene animals may have occupied the caves during the Miocene or Pliocene period, which were afterwards occupied by Pleistocene animals during the Pleistocene period. Thus animals of distinct and of distant epochs may have left their remains in the same caves; or have had them dragged into them by the animals of which they formed the prey. Mr. Dawkins mentions one example clearly of this kind; and there may be many more—some *undiscovered*, and some that may have been mistaken for animals of contemporary periods. In his paper on the classification of the Pleistocene animals, he observes: "One of the most remarkable facts brought to light by Mr. McEnery is the former presence of the sabre-toothed Felis (*Machærodus latidens*) in the cave of Kent's Hole. Its characteristic canines

are found associated with thousands of the teeth of hyænas. Kent's Hole is the only place where this fell carnivore has been found along with the remains of mammoth, reindeer, and other Pleistocene animals. It belongs to an *archaic type*, which sprang into existence during the Miocene time in France, Germany, and Switzerland, and preyed upon the hipparion and antelope in the plains of Marathon and on the Indian flanks of the Himalayas,—to a type that coexisted with the *Elephas meridionalis* and the Mastodon, during Pliocene times, in France, Germany, Britain, and Italy; and in South America preyed upon the gigantic sloths and horses whose remains are found in the Brazilian caves."

The facts next stated by Mr. Dawkins, clearly prove that this creature had no real connection with the Pleistocene animals, with whose abundant remains its own were found associated. "The large masses of *breccia*," Mr. Dawkins proceeds to say, "which occur in the cave-earth of Kent's Hole, are remarkable for their hard crystalline structure, and *prove* that there was a stalagmite floor in the cave *before* the introduction of the earth, and long before the formation of the present stalagmite pavement." In a portion of the cave called the "gallery," there is evidence of the undisturbed part of this ancient stalagmite, in a "ceiling," or "uppermost floor," that extends from wall to wall, "without further support than that furnished by its own cohesion." "From its being stained

with cave-earth, as well as from its position, the ceiling at the time of its deposition must have been supported by cave-earth. It would, indeed, be as impossible for a solid horizontal sheet of stalagmite to be formed in mid-air, as it would be for a sheet of ice to be formed without resting on water. From some cause or other this ancient stalagmite has been in part broken up, and the materials by which it was formerly supported have disappeared. That, however, even prior to its formation animals dwelt in the cave, is proved by the bones which are imbedded in the fallen masses. Moreover, there is reason to believe that certain fragments of bone and splinters of teeth, remarkable for their mineralisation, that have been found in the earth *now* occupying the cavern, were *derived* from this more ancient deposit; for they differ essentially from the remains with which they are now associated. So hard, indeed, was one of the canines of bear, that it has been splintered by the hand of man into the form of a flint-flake, and has evidently been used for a cutting purpose. Its fracture proves that it was mineralised before it was splintered; and as it was found in the present cave-earth, it must have been fashioned while the cave was being inhabited by palæolithic man, prior to the accumulation of the earth. For these reasons, the evidence in favour of these denser remains having belonged to the deposit which once supported the ancient floor, seems to me to be incontrovertible.

“This view opens up an entirely new field for in-

vestigation as to the discovery of the *Machærodus*; for it is very likely that this Mammal may really belong to the older cave-earth, and not to the more modern, in which the remains of the mammoth, woolly rhinoceros, and the like occur." "The presence in the cave at Oreston, in the same district, of the Pliocene *Rhinoceros megarrhinus* (an animal that has never yet been met with in any of the late Pleistocene caves or river deposits) strengthens the conclusion that some of the caves in the south of England may contain a fauna that was living before the late Pleistocene age."

And why confine such examples to the south of England? They are quite as likely to exist elsewhere. They probably do exist; but as the difference between the ancient and the more recent remains is not so marked as it is in the caves of Kent's Hole and Oreston, they may have been overlooked; and the animals of the two epochs may have been regarded as belonging to one and the same. At any rate, it must be admitted that we have in these facts a very possible source of error and of grave practical mistake. They also clearly warrant us in separating the Miocene *Machærodus* and the Pliocene *Rhinoceros megarrhinus* from the Pleistocene fauna. These two forms evidently belong to past epochs, and most probably became extinct before man and his contemporary animals appeared on the stage. Their mere association in caves with the remains of Pleistocene animals, affords no proof that the latter lived on the earth at the same

time with them; much less can such facts warrant the far-fetched supposition that man's existence reaches back into the Pre-glacial epoch. Of this our caves, *at present*, have not supplied the slightest evidence. Man himself, and the animals *satisfactorily* proved to be contemporary with him, are, by all fair rules of construction, shown to be Post-glacial. They only date from the *commencement* of what we have defined as the Pleistocene epoch, reaching from the time of man's creation, as stated in Genesis, to the occurrence of the flood.

Will these views meet the facts presented by the Victoria Cave, at Settle? We have already seen that no *probable* natural cause can account for them. Have we, then, an appropriate and adequate cause in the Noaic deluge? Let us look again at the leading facts. The *Roman* remains, though interesting, do not concern our inquiry. But below these remains there was a talus of angular stones, six feet thick; "and at this level, the committee discovered a few rude bone awls, and a bone fishspear, or harpoon, along with chipped pieces of flint, and broken bones of ox and bear, which proved that man, in a rude state of civilisation, inhabited the cave before the accumulation of this talus." From the *thickness* of this accumulation of rough materials, as compared with the *two feet* which covered up the Roman remains, the writer from whom we quote infers that these remains probably date back some five thousand years; and although all calcu-

lations founded upon such data must be liable to grave error, yet it is quite possible that these rude awls and fishspears are from four to five thousand years old. From their position, and from the fact that they were found in a *talus* of rough stones, resting on a bed of soft clay, we should, apart from any other consideration, conclude that they were what are now called *prehistoric* or *post-diluvian*. They belong to a period after the flood. In the first place, from the evidence furnished, it is certain that no great flood has occurred since the accumulation of this *talus*. No beds of *sand* or *clay* are present to testify to the action of such a flood. The *talus* has been formed by the gradual accumulation of decomposed rock and fallen stones. Hence, at some period subsequent to the flood, man occupied this cave or frequented it, and, it may be, fed on the oxen, whose broken bones are found along with his own remains. The *bear* may either have inhabited the cave, or it may have been destroyed for human food. The facts of this case, in short, are altogether in harmony with our scriptural solution of them, and are fully accounted for by that solution.

But *beneath* this fossiliferous *talus*, there was, "within the cave," a bed of clay twenty-five feet in thickness, which "contained no remains of man or of animals." As we have already shown, the absence of angular pieces of stone in this deposit proves its rapid accumulation. Had its deposition been slow, it must, like the *talus* which rested upon it, have been largely

composed of such stones. Whatever, therefore, was its cause, its formation could not have occupied any great amount of time. It is not stated that it was at all stratified. From the description given of it, we should, on the contrary, infer that it was one homogeneous mass of unstratified clay,—a further proof of its rapid accumulation, and that that accumulation was owing to *one cause*. Could any cause be found in this district equal to produce, and to produce *in a short space of time*, the deposit in question? On all natural principles, the answer must be an emphatic *No*. In the locality of this cave, no such cause could exist. As the suitable, and as the only adequate cause, we can think of nothing but the *mud-charged* waters of the deluge. These waters would meet the whole of the conditions presented. They would form the requisite volume, supply the materials for the accumulation of the clay, would deposit that clay by a rapid process, and accumulate it in the position where it is now found. During its one hundred and fifty days of quiet, the flood, having previously dropped all its *coarser* materials, would deposit, and probably free both of human and of animal remains, a mass of unstratified clay.

This clay, we are told, formed a serious obstacle to any further examination. “Fortunately, however, the enterprising gentlemen who form the committee, have lately sunk a shaft, and have obtained evidence of a still older occupation of the cave, not by man, but by

hyænas. The *broken* bones, coprolites, and teeth of these animals, show that in ancient times they lived there in considerable numbers; and the gnawed bones and teeth of mammoth, bison, reindeer, red-deer, the great woolly rhinoceros, and the cave-bear, belong to the creatures which formed their prey." From the fact that pieces and masses of stone are *not* mentioned in connection with "the accumulation of earth and bones" forming this deposit, we should naturally infer their absence. This inference is warranted by the consideration, that were such pieces of angular stone present, the *non-mention* of them would be an omission of which no writer professing to describe this deposit would be guilty. And if absent from it, then, as in the case of the non-fossiliferous clay, which we suppose (though on this point the description is indefinite) lies above it, its accumulation must have been rapid. Had the cave *itself* been *long inhabited* by the hyænas, their remains and the remains of the animals which formed their prey would inevitably have been mingled with masses of the rock which, during the long period supposed, would be sure to fall from the roof of the cave. How, then, is their accumulation *in the cave* to be accounted for? Their accumulation *itself* must have demanded long periods of time. The abundance of the bones, both of the hyænas and of the animals on which they fed, plainly proves the lapse of many ages. How, then, are the apparently inconsistent facts of the case to be met?

Any local floods, or any succession of local floods, are out of the question. Supposing them existing, they could not produce the phenomena present in this deposit. *One* local flood could *not* produce the deposit; and a succession of floods could not produce a deposit so *homogeneous in its character*. Thus, again, we are shut up to the *one* Noaic deluge. Will this solve the facts?

From the position and character of this deposit, we should at once conclude that it belongs to what we have defined as the Pleistocene epoch, or the period which elapsed between the creation of man and the deluge. *The animal remains are unquestionably antediluvian*. They are a remarkable and instructive group. We miss *man* and "the cattle," the domestic animals, from them. Had man been present in this deposit, as in the one above the stiff clay, the absence of the ox and of the other domestic animals might have been difficult to account for. *In this particular locality*, from some cause or other, man and the domestic animals seem never to have made their appearance during the antediluvian epoch. The region about Settle appears to have been *unsubdued* by man, and to have been left altogether to "the beasts of the earth." As man must have existed at the time in the not very distant regions of Kirkdale cave, and of the fissure in Weardale, his absence at Settle may not be easily accounted for; it may have been occasioned by something peculiar to this locality.

But the most important question is, How were these remains introduced into the cave? For reasons given above, they could not have been originally deposited where now found. *If rapidly formed*, the accumulation could not have resulted from the hyænas gradually leaving their own remains and those of the animals on which they preyed in the cave. Hence, wherever first accumulated, it certainly was not in the cave itself. This is also proved by the condition of the bones themselves. The hyænas would gnaw, and probably *break*, the bones of the animals on which they preyed, but they *would hardly break their own bones*. The accumulations might occur *in* or *before* the *mouth* of the cave, or *around* it, during a large portion of the antediluvian epoch; and it is easy to suppose *how* they would be drifted into the cave, and be rapidly deposited in it, by the *earlier* action of the deluge; and how bones, that had long been exposed to the action of the elements, would be broken during the process. These considerations also explain *how* what appears to be a vertical fissure, has been filled up,—and filled up “from an unknown depth”—“with earth and bones.”

This cave thus represents four separate geological epochs:—*the antediluvian period*, during which the hyænas and their prey inhabited this neighbourhood; *the earlier part of the deluge*, when the remains of these animals were drifted into the cave; *the one hundred and fifty days*, during which the mud-charged waters of the flood accumulated the unfossiliferous clay; and

the period *after* the deluge, when man and the domestic animals became occupants of the scene.

And with this general, but remarkably close, correspondence between the probable physical effects of the deluge, and its present evidences as yielded by this Settle cave, we may well be content! What other solution possesses, we do not say an *equal*, but anything *like* an equal claim, to our rational belief? *It has nothing to suppose*; it has not to take a single fact for granted. Nor does it need that a single fact should be overlooked or distorted. What theory, brought forward by the advocates of man's extreme antiquity, can furnish the same tests of thoroughness? If, indeed, manifold and often violent supposition constitute the excellence of any theory, then, we confess, that our biblical solution must yield the palm to the theories of its opponents. In short, *if* the more of supposition, the more likely be the formula of the proof, *then* we feel compelled to retire from the arena of battle, and to allow the opponents of the *accuracy* and *truth* of the Jewish historian, Moses, to claim the victory over us.

We fear, however, that the serious reader, who is anxious to come at the real truth of the matter, will demur to this conclusion, and will demand, not supposition, but *proof*. That proof we have endeavoured to furnish. Independently of its scriptural authority, it has been shown that the Noaic deluge will unspeakably the best explain the facts with which we have to deal. To its agreement with accurate Scripture statement, it

unites the fullest conformity with well ascertained geological fact. On the actual threefold *form* of *Pleistocene* deposit, and on all the apparent anomalies and variations which each separate form presents, it throws the clearest and most satisfactory light; and of them it furnishes the most complete and consistent explanation. Before its application, seeming difficulties either vanish altogether, or are greatly lessened in their magnitude; while apparent contradictions are harmonised, and what at first sight appeared to be *conflicting* evidence, brightens into the most perfect agreement.

CONCLUSION.

The conclusions arrived at stated.—The state of the earth before man.—The extent of the deluge.—Where are the remains of the men and animals destroyed by the flood?—Traditions and monuments.—Described by others.—The account of the deluge on a tablet discovered and translated by Mr. G. Smith of the British Museum.—This monument important and interesting.—The discovery timely in this age of scepticism.—The discovery of the physical effects of the deluge, as evidence of its occurrence, will yield the same service to the cause of truth.

SUCH is the safe goal in which our investigations have landed us. Manifold fact and cogent logical consideration have led us to believe, as was long since urged by the late Sir R. Murchison, that the earth had acquired the same general configuration of hill and valley, at the commencement of the Quaternary period, as it presents now. Local or more general oscillations of level, partial submergence or slight deepening of some valleys, and especially where the fall is considerable, and the rising of others by fluvial deposition, which have probably occurred since the creation of the human race, may have somewhat modified the face of the earth, but not so as to interfere with its grand outlines. Thus the long series of ages demanded by the advocates of man's great antiquity, for the gradual erosion of our river valleys, is

rendered unnecessary. The different deposits of gravel and sand which they contain, however various in height and position, can be much better accounted for by the manifold action of the Noaic deluge than they can by any theories of erosion, however plausibly stated, and however great the authority of the names by which they are upheld. All such theories deal so largely in supposition, and after all afford such lame solutions of indubitable facts, that we feel it a relief to escape from them, and to find ourselves resting on clear Scripture statement, and on clear Scripture statement found to be in entire harmony with carefully collected geological fact.

As we have already seen, to produce the phenomena which our Pleistocene deposits present, the deluge had at its command all the materials of the antediluvian period, and probably of still older epochs, as well as its own debris. A large portion of the earths and gravels forming our Quaternary deposits, probably existed in our valleys long before the deluge denuded, modified, or redeposited them, and mixed with them antediluvian and diluvian remains.

It will also be remembered that we have designedly left the *extent* of the deluge undetermined. All that we have ventured to determine positively is, that its extent was unquestionably commensurate with that of the distribution of the human race at the time of its occurrence. The evidence supplied by man's own remains, and by those of his contemporary animals, up

to the present time, would warrant us to conclude that it embraced all, or the greater part, of *Europe*, and *Asia*, *North*, *Central*, and perhaps part of *South America*, and the greater part of *North Africa*. India, Egypt, Russia, Denmark, Germany, France, and Great Britain, Canada and the States of America, have all yielded human remains, and some of them have yielded them in great abundance. Hence, all these countries must have been covered with the waters of the deluge; and in all the wide area which they embrace, the men and the land animals *then* existing in them must have perished. We make the statement subject to correction, but we believe that no human remains of the so-called Quaternary age have as yet been found in *outh America*, nor in South Africa, nor yet in Australia. Should human remains, of an age similar to those found fossil in Europe, be also discovered in these countries in similar deposits, then, of course, we should be prepared to contend for a *strictly* universal deluge. Regarding, as we unhesitatingly do, the deluge as of *miraculous* origin, no mere physical difficulties would prevent our believing in its absolutely universal occurrence, if the presence of human remains, in unquestionable Quaternary deposits, warranted it. But until such discoveries are made, we are content to believe in a *partial*, but still a very *extensive*, deluge. And leaving the matter thus, *future* discoveries, *which are sure to be made*, will neither surprise nor puzzle us. We shall have no new theory to devise to meet them,

nor to account for them. They will fall into their proper place, and arrange themselves beneath phenomena already accounted for.

We have also endeavoured to answer the question, Where are the remains of the men and of the animals destroyed by the flood? That at the period of its occurrence they existed in great numbers, we have already shown to be probable, and must, therefore, have left their remains somewhere. Where are these remains deposited? It may be regarded as morally certain, that our fossiliferous caves contain a portion of them. Whether the degraded "children of men" resided in them, or fled to them for refuge when the flood began to prevail over the earth, they would in either case be overtaken and destroyed in them; and their abode or place of refuge would become their sepulchre. And under such probable circumstances, our caves might be expected to yield entire human skeletons. Nor is this the only probable source of such skeletons. Human, as well as animal bodies, it is probable, would be *drifted* into the caves and open fissures by the action of the flood, and be entombed within them, either alone or blended with any remains which such caves and fissures might previously contain. And it is easy to conceive how, under such circumstances, both human and animal skeletons might be preserved entire. And is it not highly probable that the remains of the so-called palæolithic men, that have been found in many of our caves, had

this origin? All things considered, it is indisputably the most rational one.

The valley gravels, the brick-earths, and the loess, may also contain some of the remains of the men and animals which perished at the flood. The beds of rivers are probable places for such remains, and especially for entire human and animal skeletons. The human skeleton found a few years ago in an old bed of the river Trent, at Newark, is probably but an example of many similar interments. Raised beaches and deposits near the mouths of rivers are also likely localities to search for these solemn antediluvian relics. Many would be left on the dried face of the earth, and under the ordinary action of the elements, would soon perish and crumble to dust. Lakes, and even swamps and smaller bodies of water, would receive many of the floating bodies which charged the flood; and if dried up and drained, their beds would not fail to yield us many of their skeletons. Still, we think of the ocean depths as the principal solemn repository; and 'the number of the dead which it is said "the sea shall give up" on the resurrection morn, would be vastly increased by the stupendous flood which "overthrew the world of the ungodly." The dark, the restless, but sometimes placid, sea, is not only the grave of the millions which rock and storm and maddened warfare have engulfed in it, but also of the millions of daring and ripe transgressors destroyed by the Noaic flood.

THE TRADITIONS AND MONUMENTS OF THE DELUGE.

These have been carefully collected and described by others; and, moreover, they do not fall within the purpose of this work. An epitome of both may be found in Dr. Kitto's "Daily Bible Readings"; and a lengthened account of national traditions respecting the deluge is given in an old unique volume on the subject, by Mr. A. Catcott, published in 1761. But although it forms no part of our purpose to review this branch of the general subject, yet, in conclusion, we may afford it a passing notice; and especially as the date of this work is so strikingly coincident with the *discovery* of an ancient monument by Mr. G. Smith, of the British Museum, among the Assyrian columns in that institution, containing an inscription of the deluge. The following is an outline of this interesting discovery:—"The cuneiform inscription which I have recently found and translated, gives a long and full account of the deluge. It contains the version or tradition of this event which existed in the early Chaldean period of the city of Erech (one of the cities of Nimrod), now represented by the ruins of Warka. In this newly-discovered inscription, the account of the deluge is put as a narrative into the mouth of Xisuthrus, or Noah. He relates the wickedness of the world, the command to build the ark, its building, the filling of it, the deluge, the resting-place of the ark on a mountain, the sending out of the birds, and other matters.

The narrative has a closer resemblance to the account transmitted by the Greeks from Berosus, the Chaldean historian, than to the biblical history, but it does not differ materially from either; the principal differences are as to the duration of the deluge, the name of the mountain on which the ark rested, the sending out of the birds, etc. The cuneiform account is much longer and fuller than that of Berosus, and has several details, omitted both by the Bible and the Chaldean historian. This inscription opens many questions of which we knew nothing previously, and it is connected with a number of other details of Chaldean history, which will be both interesting and important. This is the first time any inscription has been found with an account of an event mentioned in Genesis."

This account of the deluge, from an old Assyrian inscription, possesses a high degree of interest, as it at once, directly, and without any intervening testimony, transports us several thousand years nearer to the period of its occurrence. The "cities of Nimrod," the great-grandson of Noah, arose almost beneath the shadow of the ark; and their inhabitants must have retained a vivid, though somewhat modified, and perhaps distorted, tradition of the fearful flood of waters that had destroyed their ancestors. If this additional proof were needed, such a record of the deluge, so directly handed down to us from a date so near to the time of its actual occurrence, would go far to demonstrate that occurrence. If the event had not really

transpired, and had not been universally admitted, such a record of it, when disproof was so near at hand, would never have been inscribed upon a public monument. Such confirmations of the truth and correctness of Scripture, though they really cannot add anything to the certainty of its statements, are yet deeply interesting, and may be fittingly used to silence the objections of unbelief.

In this age of scepticism, when old beliefs are all challenged, and there seems a disposition to call everything in question, many such monuments may turn up to repel the assaults of enemies, and confirm the faith of the wavering. We find, indeed, a benign and ever-watchful Providence supplies the remedies and the good appropriate to the evils and wants of each period of human progress, as they occur. New discoveries of gold, and of other metals and minerals, are made, as the multiplying and spreading populations of the globe, and the commercial and social necessities of mankind, and the growing demand of philanthropic and religious enterprise, require them. So monuments, whose inscriptions confirm the accuracy of biblical statement, and testify to the truth of Scripture fact, may have lain undisturbed, or unnoticed, or undeciphered for ages, until an epoch of wide-spread and plausible scepticism needed their discovery to silence its cavils and to rebuke its presumption.

And that such will also be the case with regard to our Post-glacial and Pleistocene deposits, we are fully

prepared to believe. The proof which these deposits supply of tremendous and destructive *water-action* will, we are persuaded, when mistakes and theories and prejudices are cleared away, afford a manifold evidence for the occurrence of the scriptural deluge sufficient to satisfy any candid mind, and to leave every unbeliever without excuse. Further geological discovery, and a better and more correct reading of its phenomena, will furnish the antidote to the doubt and to the apparent denial of Scripture truth to which its first discoveries and theories gave rise. When carefully examined in the light of Scripture statement, and as illustrated by Scripture history, *scientific fact* will be found to be the echo of its truth, and the best exponent of its meaning. The word and the works of the great Creator will be found to be in perfect harmony with each other, and to utter a united testimony to the omnipotent power of His arm, and to the perfect wisdom and righteousness of His government. Illustrations and proofs of Jehovah's miraculous interposition to drown the old world of sinners will, we doubt not, multiply and brighten; and will thus tend to quicken and confirm the faith of the world in the truth of the prophetic declaration which announces another Divine interposition *still* more dreadful, "when the heavens and the earth shall be burnt up, the elements shall melt with fervent heat, and both the heavens and the earth shall pass away." *

* See the Duke of Argyll's annual address before the Geological Society.

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